Government Bill 2024/25:150

Financing and risk-sharing for investments in new nuclear power

Prop. 2024/25:150

Bill submitted by the Swedish Government to the Riksdag.

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Main content of the Bill

In this Bill, the Swedish Government proposes a new Act on state aid for investments in new nuclear power. The Act regulates the basic conditions and procedures for state aid to companies looking to invest in new nuclear reactors in Sweden. Aid may be granted in the form of central government loans and two-way contracts for difference (CfDs), i.e. a contract between a power-generating facility operator and central government (the state) that provides both minimum remuneration protection and a limit to excess remuneration. Central government loans may be granted for the construction and test operation of new nuclear reactors, and for project planning and other preparatory measures for their construction. Two-way CfDs may be entered into for the commercial operation of new nuclear reactors. Aid will be subject to terms and conditions regulated in contract between central government and the beneficiary company. Aid may only be granted if the new nuclear reactors are located in the same place and have a total installed generator capacity of at least 300 MW of electric power (300 MWe). If there are special reasons for doing so, the Government may decide to grant aid even if the reactors have a total installed generator capacity of less than 300 MWe.

It is proposed that the new Act enters into force on 1 August 2025.

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1 Proposal for a resolution by the Riksdag

The Government's proposal:

The Riksdag adopts the Government's proposal for a new Act on state aid for investments in new nuclear power.

2 Proposed Act on state aid for investments in new nuclear power

In accordance with a decision by the Riksdag (the Swedish Parliament), the following is enacted.

Introduction

Section 1 This Act contains provisions on state aid to companies for investments in new nuclear reactors in Sweden.

Loans and CfDs

Section 2 Aid may be granted in the form of central government loans and two-way CfDs.

The aid is designed to incentivise efficient resource utilisation in the construction, possession and operation of new nuclear reactors. The aid is also designed to ensure a judicious allocation of risks and profits between central government and the beneficiary company.

Central government loans may be granted for the construction and test operation of new nuclear reactors, and for project planning and other preparatory measures for their construction.

Section 4 Two-way CfDs may be entered into for the commercial operation of new nuclear reactors.

Section 5 The aid is subject to terms and conditions regulated in contract between central government and the beneficiary company.

These terms and conditions must take into account:

1. central government's risk;
2. central government's ability to assert its rights; and
3. central government's needs for control and monitoring.

Prerequisites for aid

Section 6 Following an application to this effect, the Government may decide to grant aid to a company for the purposes referred to in Sections 3 and 4.

Aid may only be granted if the new nuclear reactors within the meaning of Sections 3 and 4 are located in the same place in Sweden and have a total installed generator capacity of at least 300 MWe. If there are special reasons, the Government may decide to grant aid even if the reactors have a total installed generator capacity of less than 300 MWe.

Section 7 Aid may only be granted to a company whose exclusive or virtually exclusive purpose is the construction, possession and operation of the new nuclear reactor or reactors to which the decision to grant aid relates.

Section 8 Aid may be granted only when CfDs within the meaning of Section 5 are entered into.

Section 9 Aid may be granted only after a company has applied for the licences required under the Nuclear Activities Act (1984:3) and the Swedish Environmental Code for the construction, possession and operation of the new nuclear reactor or reactors to which the decision to grant aid relates.

Section 10 Aid may only be granted to a company if:

1. Persons who have a qualifying holding in the company are suitable to exert a significant influence over the management of the company; and
2. Persons who are part of the company's management are suitable for such a task.

Qualifying holding means here the same as in Chapter 1, Section 5, point 15 of the Banking and Finance Business Act (2004:297).

Right to issue regulations

Section 11 Pursuant to Chapter 8, Section 7 of the Instrument of Government of Sweden, the Government may issue additional regulations governing aid under this Act.

This Act will enter into force on 1 August 2025.

3 The matter at hand and its preparation

On 20 December 2023, an expert (Inquiry Chair) was commissioned to assist the Ministry of Finance in developing and proposing models for financing and risk-sharing for new nuclear reactors (Fi2023/03276). On 12 August 2024, the Inquiry Chair submitted the memorandum *Financing and risk-sharing for investments in new nuclear power* (Fi2023:F). A summary of the memorandum can be found in *Annex 1* (in Swedish only). The Act proposed in the memorandum can be found in *Annex 2* (in Swedish only). The memorandum has been circulated for consultation. A list of the consultation bodies can be found in *Annex 3*. Their statements of opinion are available from the Ministry of Finance (Fi2024/01624). This Bill deals with the Act proposed in the memorandum.

4 The need for state aid for new nuclear power

4.1 The need for nuclear power in the electricity system

The Government's assessment: New nuclear reactors need to be built in Sweden in order to:
– achieve the climate and energy policy objectives;
– meet future electricity demand, including the connection of new industry;
– improve continuity of supply in the electricity system and increase the transmission capacity in the transmission network;
– reduce price differences between the Swedish bidding zones; and
– contribute to competitive prices for electricity customers.

The memorandum's assessment largely accords with the Government's assessment. However, the memorandum does not take a position regarding the need for nuclear power for improved continuity of supply, reduced price differences between Swedish bidding zones or competitive prices for electricity customers.

Consultation bodies: Many of the consultation bodies, including *Energiföretagen Sverige (Swedenergy)*, the *Confederation of Swedish Enterprise, Fortum Sverige AB (Fortum), Vattenfall AB (Vattenfall)* and *KTH Royal Institute of Technology (KTH),* welcome the Inquiry's proposal. KTH contends that nuclear power is a very important part of the Swedish electricity system that, in addition to energy and power, also has particular characteristics that contribute to voltage control and frequency stability. Fortum argues that an alternative without nuclear power would entail taking a risk on the achievement of Sweden's climate, industry and national security objectives, because the alternative involves the development of new technology at a scale and speed that is as yet untested, and at a cost that is largely unknown. Fortum also contends that a number

of studies show that the total system cost is probably lower with a balanced electricity system that includes a certain proportion of plannable base power in addition to weather-dependent and flexible electricity generation. *Sydkraft AB (Uniper)* contends that the proposal at issue is an important piece of the puzzle in the Government's energy policy planning and continuity of supply objectives that will lay the foundation for an extensive expansion of the entire electricity system to support Sweden's competitiveness and welfare system, and to achieve its adopted climate objectives. *Statens energimyndighet* (the *Swedish Energy Agency)* points out that for the foreseeable future nuclear power will be an important component in Sweden's electricity supply. *Affärsverket svenska kraftnät (Svenska kraftnät),* which is a government agency responsible for the national grid and operated in the form of a state-owned enterprise, considers that new nuclear power will improve supply adequacy and benefit the system in the form of rotational energy and reactive power.

Some consultation bodies, including *Chalmers University of Technology AB (Chalmers)* and the *Swedish Society for Nature Conservation,* highlight that there are numerous studies showing that there are solutions other than nuclear power that can provide for the needs of the electricity system. The *Swedish Wind Energy Association (SWEA)* also contends that base power needs can be met using many different technologies.

Many consultation bodies, including Chalmers, the *Research Institute of Industrial Economics* (*IFN)*, the *National Institute of Economic Research*, the *Swedish Trade Union Confederation (LO)* and the *Swedish Environmental Protection Agency*, argue that there is a need for socio-economic analyses of the need for new nuclear power. Chalmers*, OX2 AB (OX2), Statkraft Sverige AB (Statkraft),* the *Swedish Solar Energy Association, SWEA,* the *World Wide Fund for Nature (WWF)* and *100 % Förnybart* also assess that the first priority should be to invest in the rapid technological development of renewable energy, energy efficiency, and various forms of storage.

SWEA emphasises that rapid technological development and rapid development of the electricity system is occurring, and that the question of whether an electricity system will be cheaper with or without new nuclear power has not been investigated thoroughly enough.

Bodecker Partners argues that the expansion of nuclear power also risks increasing volatility in the market and the number of hours with negative market prices.

Reasons for the Government's assessment

A sharp increase in future electricity demand increases the need for new nuclear power

Compared with many other countries, Sweden's electricity system is reliable, cost-effective and environmentally sustainable, not least thanks to a high proportion of plannable electricity generation. Plannable generation means generation that can be regulated in an easy and predetermined way. Types of power such as hydropower, nuclear power and thermal energy are considered to be plannable because the load can be controlled. Types of power such as solar and wind are not considered to be plannable because the load is determined by the weather conditions at

the time. Sweden's electricity system is also in principle fossil-free and has an energy surplus that, on an annual basis, has resulted in Sweden being a net exporter of electricity. In light of this, Sweden is well-placed for the ongoing electrification of society. But Sweden is also facing a number of challenges that the Government assesses cannot be solved without investments in new fossil-free, plannable, electricity generation.

Most of the consultation bodies, including the *Confederation of Swedish Enterprise* and the *Skogen, Kemin, Gruvorna och Stålet (SKGS)* – a collaboration between Sweden's forestry, chemical, mining, and steel industries – contend that a stable, reliable and competitive electricity supply is fundamental for a successful climate transition and long-term economic growth in Sweden. A strong expansion of the electricity system is needed to achieve the climate objectives and enable the green transition. The report on the task on joint-agency monitoring of society's electrification (I2022/01060) submitted to the Swedish Energy Agency, the Swedish Energy Markets Inspectorate, Svenska kraftnät and the Swedish Transport Administration, estimates that the annual electricity demand in 2045 will be in the range of 200–340 TWh (Swedish Energy Agency 2024). This can be compared to today's annual electricity consumption of around 135 TWh. The scenarios for electricity demand are based on the anticipated electrification of society and the growth in Swedish industry, both of which are of great importance for the climate transition. What actual electricity consumption will end up being depends, among other things, on how industry will implement the transition to fossil-free energy and the size and scale of new industries established that are dependent on fossil-free electricity. This in turn will depend on the availability of electricity at competitive prices and the possibility of connecting new consumption to the electricity networks.

Most of the consultation bodies, including *Svenska kraftnät* and the *Swedish Energy Agency*, agree that there are uncertainties about the rate of the future increase in electricity demand, but that a sharp rise in electrification is probable. In its Energy Policy Framework Bill, the Government reported its current view as being that Sweden should plan to be able to meet an electricity demand of at least 300 TWh in 2045 (Govt Bill 2023/24:105 p. 20). That a stable and fossil-free electricity supply can be provided to the extent necessary to meet the needs of industry is currently not a certainty, and this is having a negative effect on investment in industry, such as delaying certain investments. This uncertainty would decrease with the establishment of new nuclear power.

In its 2025 report *The Path to a New Era on Nuclear Energy*, the International Energy Agency (IEA) states that there is global momentum for nuclear power, and that interest in nuclear power is at a peak not seen since the oil crisis in the 1970s, with support schemes for new nuclear power in 40 countries. The background to this is electrification and rising demand for electricity, where nuclear power has several advantages such as clean and plannable electricity generation with the potential to reduce greenhouse gas emissions, improve energy security, and supplement renewable energy. At the 28th United Nations Climate Change Conference (COP 28) in Dubai in 2023, 197 countries agreed on the need for substantial and urgent emissions reductions, and agreed to take action in the energy sector, including a tripling of renewable energy and doubling

of energy efficiency by 2030, and to accelerate the development of nuclear power alongside other low- and zero-emissions technologies. At a side event during COP 28, some 25 countries, including Sweden, also signed a declaration to triple global nuclear capacity by 2050. Furthermore, in its 2022 report *Nuclear Power and Secure Energy Transitions*, the IEA recommended that nuclear power nations should extend the lives of their existing nuclear power plants and create financial frameworks to facilitate investment in new nuclear power. The IEA also highlighted the doubling of nuclear power by 2050 as one of four milestones in its 2023 report *Net Zero Roadmap*. All in all, the importance of nuclear power for the transition to net zero emissions has increased globally.

Continuity of supply in the electricity system needs to improve

Continuity of supply can be divided into adequacy and operational security. These terms are defined in EU regulations. Adequacy means the ability of in-feeds into an area to meet the load in that area. Operational security means the transmission system's capability to retain a normal state or to return to a normal state as soon as possible. These two aspects are also interdependent. The continuity of supply objective means that the Swedish electricity system must have the ability to supply electricity where demand exists, at the right time and in sufficient volumes, to the extent that is socio-economically efficient. In an electricity system that has continuity of supply, both the energy and the demand response need to be sufficient, and the electricity system needs to have the ability to satisfy operational security requirements when new electricity consumers and electricity generators are connected.

A secure and robust energy supply is fundamental to a society that is safe and secure with a high degree of electrification, and a reliable electricity supply is essential for Sweden's total defence. Continuity of supply thus also concerns disturbed conditions, that the electricity supply can be maintained at all crisis levels – including in a heightened state of alert – and that the requisite capabilities need to be present in all five system states (normal state, alert state, emergency state, blackout state and restoration state). This also includes sufficient regional capability for island mode operation and the capacity to rapidly restore the system after a blackout state. Plannable electricity generation is needed for the Swedish electricity system to have the requisite capabilities at all crisis levels and in all system states. According to Svenska kraftnät's forecast in its Balance Report from 2024, from 2025 wind power will be the type of power in Sweden with the highest installed capacity (18 000 MW). The Government argues that from a continuity of supply perspective, this makes it more and more important to ensure an electricity generation mix that has a sufficient amount of plannable electricity generation. In its consultation response, Svenska kraftnät states that it should be possible to use new nuclear power plants in all system states. Nuclear power constitutes a significant portion of Sweden's electricity supply and contributes plannability and stability to the system. The Government argues that new nuclear power would further contribute to the capabilities that are necessary in the electricity system.

Nuclear power provides important capabilities and ancillary services that contribute to operational security but for which no compensation is paid, such as rotational energy and voltage control. Svenska kraftnät states in its report *Uppdrag att lämna förslag till norm för driftsäkerhet i fredstida normalläge* (Assignment to submit a proposal for an operational security standard in peacetime normal mode – Interim Report 2, 18 April 2024) that operational security in the Swedish transmission system is high but that the time that the system is not in normal state has risen in recent years. Svenska kraftnät points out that there are many reasons underlying this development, but that the main one is increased weather-dependent electricity generation, reduced plannable and synchronously connected electricity generation, and increased integration into the EU's internal market for electricity. This has led to challenges for operational planning in the form of increased unpredictability and fewer opportunities for the generation to contribute voltage control, for example. At the same time, Swedish electricity consumption is expected to double by 2045, with the expectation that a large portion of future demand will be met by new, weather-dependent electricity generation. Svenska kraftnät also describes a growing challenge to maintain operational security without limiting the transmission capacity or the possibility of new connections.

In the report *Stärkt försörjningstrygghet i energisektorn* (subtask 3, 29 December 2023) (Strengthened security of supply in the energy sector), Svenska kraftnät contends that the geographical location of power plants is important for several stability phenomena and mention is made of the location of new nuclear power as an example of this. Furthermore, Svenska kraftnät writes that today's directly connected nuclear power contributes to good voltage stability in southern Sweden given its location and connection point to the transmission network.

The Government assesses that adding more plannable and synchronously connected electricity generation in the form of nuclear power would make an important contribution to increasing operational security. Furthermore, new plannable power in southern Sweden, such as nuclear power, should improve the capacity utilisation of existing power lines.

The Swedish electricity system is facing increased challenges in the area of adequacy. The power balance, i.e. the difference between the generation and consumption of electricity within a geographical area at a given time, has deteriorated. Since 2020, the expected national power balance for a normal winter has varied between a deficit of 1 300 MWh/h and 1 700 MWh/h for the hour in the year when demand for electricity is highest (*Kraftbalansen på den svenska elmarknaden,* Svenska kraftnät 2024) (Balance in the Swedish electricity market). By comparison, the expected national power balance for the winter of 2013/14, when there were ten nuclear reactors in operation in Sweden, amounted to a surplus of just over 1 100 MWh/h (*Kraftbalansen på den svenska elmarknaden vintrarna 2012/2013 och 2013/2014*) (Balance in the Swedish electricity market: winters of 2012/2013 and 2013/2014). This shows that Sweden is more dependent on imports of electricity in high-load situations, which usually occur on cold winter days. Especially in southern Sweden, the situation has deteriorated. In a European comparison from 2023, bidding

zone SE4 in southern Sweden was identified as the bidding zone with the lowest available installed generator capacity in relation to the peak load hour.

The total installed electricity generation capacity has increased in Sweden during the same period as the power balance has deteriorated. This is because different types of generation have different availability factors, i.e. how much of the installed generator capacity is expected to be able to generate electricity in the peak load hour. Between the end of 2013 and the end of 2023, about 4 000 MW of high-availability plannable electricity generation has been phased out in Sweden. Over the same period, almost 16 000 MW of wind and solar power have been added. Electricity consumption during the peak load hour in a normal winter in Svenska kraftnät's forecasts has not changed to any great extent during the period. This shows that new electricity generation from mainly wind power, which is not plannable, has not been able to compensate for discontinued production with high availability such as nuclear power and cogeneration.

A deteriorating national power balance indicates that Sweden risks experiencing problems with resource adequacy if the increased need for electricity is to be met with weather-dependent electricity generation. Different types of power contribute to resource adequacy, i.e. the ability to meet end-users' electricity demand at all times, which, unlike the adequacy factor mentioned above, can be expressed in the de-rating factor of each type of power. This is described by Svenska kraftnät in the report *Strengthened security of supply in the energy sector* (subtask 3, 2024). It shows that 1 000 MW of future nuclear power would enable connection to the network of 740 MW of future electricity consumption without affecting resource adequacy. The corresponding result for 4 000 MW of future onshore wind power is the connection of 460 MW of electricity consumption.

One conclusion from the scenarios that Svenska kraftnät uses in its latest long-term market analysis (LMA) from 2024 is that consumption flexibility will be important in all scenarios up to 2045, but especially in the two scenarios with high electrification, where one includes nuclear power and the other does not. The report shows that in the two scenarios that include nuclear power, the increase in future flexible consumption needed to achieve the agreed reliability standard for one hour per year is not as high. The report also shows that the need for expanded transmission capacity is less with more nuclear power, as generation is located much closer to regions and areas with high electricity consumption. Svenska kraftnät also points to a large increase in the need for reserves in the scenario involving the expansion of renewable electricity generation only.

Against this background, the Government is of the view that new, plannable electricity generation is needed to meet future electricity demand with good continuity of supply. New, plannable electricity generation means that new industry can be connected efficiently since the adequacy of the system increases while also contributing to increased operational security.

The relatively long distances between hydropower resources in the north and areas with higher electricity consumption in the south have had a major impact on the development of Sweden's electricity system over the years. This has led to the need to build a strong transmission network in the north–south orientation. When nuclear power was expanded in the 1970s and 1980s, electricity generation capacity in Sweden doubled. All nuclear power plants were located close to consumption in central and southern Sweden. In pace with six out of twelve large-scale nuclear reactors having been phased out in Sweden, trade in electricity with our neighbouring countries has increased. This has contributed to electricity prices in southern Sweden being high at times – when demand for electricity is high, or when weather-dependent electricity generation is low.

This development, which has been augmented by migration to metropolitan regions, has contributed to more frequent constraints in the transmission network. Additional constraints on transmission capacity for operational security reasons following the closure of the Ringhals 1 and 2 reactors has made this development particularly evident. Among other things, this has resulted in differences in electricity prices between bidding zones within the country arising more and more frequently. Following the introduction of bidding zones in Sweden at the end of 2011, electricity prices were relatively equal in all bidding zones, with some exceptions for shorter periods, until autumn 2019. After that, prices began to differ slightly, and during the summer and autumn of 2021 the prices differed significantly. During the energy crisis in 2022 and 2023, there were large variations in price between the bidding zones. During that period, the prices in the bidding zones also often varied considerably depending on the hour of the day or night. From mid-2023, the differences have been smaller, but it remains clear that bidding zones SE3 and SE4 generally have higher and more variable prices than bidding zones SE1 and SE2.

The large amount of wind power that has been constructed has also increased the price volatility in the electricity market. Price volatility makes future electricity prices less predictable, and can have negative effects on investment in electricity-intensive industries, on investment in new electricity generation plants, and on society as a whole. Greater price volatility and differences in electricity prices between bidding zones increase the need for hedging among market participants, at the same time as this has become more difficult. An expansion of weather-dependent electricity generation is described in the memorandum as reducing the average earnings for these types of power because generation from weather-dependent types of power co-varies with and contributes to lower electricity prices at times when they are generating electricity. An important reason why new nuclear power is needed is to meet a greatly increased electricity demand. New nuclear power should therefore be expanded in parallel with the demand for electricity increasing. Contrary to *Bodecker Partners*, the Government therefore assesses that there is a low risk that the number of hours with negative electricity prices would increase as a result of adding new nuclear power. When it comes to a

change in the price volatility, the impact of new nuclear power must be compared to the expansion of other electricity generation. The memorandum states that it is difficult to determine the long-term effect of new nuclear power on electricity prices compared to an electricity system that is dominated more by wind power, but that a review of studies that simulate future price developments clearly shows that new nuclear power results in lower price volatility.

In light of this, the Government assesses that new nuclear power in suitable locations is needed to increase the transmission capability in the transmission network and reduce price differences between Sweden's bidding zones. New nuclear power with low, short-term marginal costs also contributes in general to competitive electricity prices for electricity customers.

Technological development and alternatives to nuclear power

A large proportion of the plannable electricity generation in Sweden consists of nuclear power, hydropower, and cogeneration. Both hydropower and cogeneration have the potential to contribute more to the electricity system, for example through increased load, and through their control capabilities. However, neither of these types of power can be expanded to the extent that could meet the demand for plannable electricity generation that is foreseen. In other EU countries, plannable electricity generation is largely from coal- or gas-fired power stations. The expansion of such plannable electricity generation is not compatible with either the EU's or Sweden's environmental and climate objectives.

Several consultation bodies, including *Chalmers* and *SWEA*, argue that investing in the development of renewable energy and storage technologies has higher priority than supporting new nuclear power. The Government shares the view that the rapid development of technology in these areas is important and that new technologies will be needed in the electricity system. In its Energy Research Bill, the Government stresses that research and innovation in the energy area should include the production, distribution, storage and use of energy throughout the entire community. Furthermore, the same Bill states that there is a need for increased investment in the development of strategically important technologies; in particular, in addition to nuclear power, batteries and hydrogen and their value chains (Govt Bill 2024/25:72 pp. 35 and 40).

Looking at the power system as a whole, Svenska kraftnät states in its 2021 system development plan for 2022–2031 that flexible electricity consumption, storage, and storage combined with non-plannable electricity generation, will not be enough for a successful transition of the power system. Additional plannable electricity generation will be needed. The Government assesses that there is a need for further technological development before intermittent, weather-dependent, electricity generation combined with energy storage such as batteries or hydrogen can be expected to generate enough electricity to meets the requirements for continuity of supply. In contrast to a number of the consultation bodies such as *IFN* and the *National Institute of Economic Research*, the Government is not of the view that decisions on aid for new nuclear power should wait for a socio-economic analysis of whether nuclear power is the

most cost-effective alternative. Forecasts and analyses cannot say with certainty what the development of new technologies in the energy sector will look like in the long term. The choice between expanding wind and solar power combined with new storage technology and an expansion where new nuclear power is also added is about balancing different risks. To ensure the conditions necessary for an expansion of the electricity system, the Government assesses that working to expand new nuclear power swiftly is justified. At the same time, the electricity demand ensuing from the industry and transport sectors' transition to fossil-free energy is deemed to be so large that it is also necessary to continue technological development to enable other types of power to offer the capabilities required to connect large volumes of new electricity consumption while ensuring continuity of supply.

4.2 The need for state aid

The Government's assessment: To enable investment in new nuclear reactors at a reasonable cost in order to generate electricity, a specifically adapted form of aid is needed that addresses the risks surrounding investment in new nuclear power.

The memorandum's proposal largely accords with the Government's assessment. The memorandum does not contain any proposal regarding the need for specifically adapted state aid, but it does point out that an important criterion in the drafting of the proposal was to reduce the Levelized Cost of Energy (LCOE) for new nuclear power and that it assumes risk sharing in the various phases of a nuclear power project.

Consultation bodies: A number of the consultation bodies including *Vattenfall, Fortum, SKGS,* the *Swedish Forest Industries Federation,* the *Confederation of Swedish Enterprise* and *Technology Industries of Sweden* argue that state aid is a prerequisite for enabling investment in new nuclear power. Fortum argues that a targeted energy policy in which different types of power receive aid based on their specific challenges is the fastest and most cost-effective way forward. Vattenfall argues that central government has a clear role which requires it addresses the specific risks that come with a nuclear project. The Confederation of Swedish Enterprise, SKGS and Technology Industries of Sweden emphasise that nuclear power projects are associated with a particular policy risk that needs to be addressed. Other consultation bodies, including the *Swedish Energy Agency,* the *Swedish Energy Markets Inspectorate, Ellevio*, *E.ON, Företagarna, Göteborg energi, Svenska kraftnät* and *SWEA,* advocate technology neutrality and that the aid should reward capabilities rather than individual types of power. *Skellefteå kraft* advocates technology-neutral rules that support the growth of all fossil-free types of power. The Swedish Energy Markets Inspectorate and *Luleå University of Technology (LTU)* argue that more analysis is needed to assess whether the proposed aid for nuclear power is socio-economically more efficient than alternative solutions.

Reasons for the Government's assessment

High level of uncertainty leads to high risk premiums

A feature of nuclear power projects is their high design costs and long construction periods. It takes a long time from the start of construction until revenue is generated from the sale of the electricity generated. The cash flows in a nuclear power project therefore give rise to a large financing need to bridge the time gap between expenses and revenues. Furthermore, investment in nuclear power is associated with a number of somewhat unique risks. The memorandum identifies design risks, market risks and policy and regulatory risks as particularly important. Design risk refers to the risk of cost and time overruns. Market risk refers to the uncertainty surrounding future price levels in the electricity market. Regulatory risks include unclear or changed safety requirements, and policy risks means the policy decisions that can change the conditions for operating nuclear power plants. Uncertainty about the possibility of realising economies of scale, which is termed the programme risk, is also seen as an important part of the risk landscape, especially for those actors who invest in the first of the projects. Uncertainties surrounding the possibility of sharing the fixed costs of a new nuclear waste programme are particularly relevant to the programme risk. The Government shares the view of the risk landscape presented in the memorandum.

A commercial actor's decision to invest in a project is based on an assessment of the project's future cash flows, and the assessed uncertainty as to whether the outcome will be as expected. Expenses and revenues over the long time horizons of a nuclear power project are difficult to forecast for several reasons. The last new reactor in Sweden was completed in 1985, meaning that cost estimates need to be largely based on projects in other countries. However, the informational value of previous project outcomes is limited – partly due to a lack of comparability between different countries' regulatory environments, and partly because the prices of the input goods used in nuclear power projects have increased in recent years. Several recent nuclear power projects have experienced large schedule and cost overruns, although there are examples of successful projects, especially where several reactors of the same design were built in succession. All in all, the uncertainties above are apparent in the fact that investors in new nuclear power demand a significant risk premium.

Efficiency reasons for aid to new nuclear power

In a well-functioning market economy, companies can be assumed to make decisions that are well-considered not only from their own perspectives but also from the perspective of society as a whole. However, there are circumstances that can give rise to a discrepancy between a private investor's business case for new nuclear power and the socio-economic equivalent. There may therefore be socio-economic efficiency reasons for supporting investment in nuclear power.

Financial markets are good at pricing and allocating calculable risks, but may demand high risk premiums when it comes to risks that are not easily calculable, or are very costly to calculate and therefore difficult to diversify away. Without risk-sharing or diversification opportunities, the risk will be concentrated on one or a small number of actors. The size of

the investment can mean a commitment that is too great for the owner company to bear alone, resulting in the investment not being made. Markets exist for hedging against some of these risks, for example through hedging arrangements between private actors. But at the time when they are deciding to invest or not, an investor in new nuclear power does not have the option to enter into arrangements of this kind that have a sufficiently long life and on terms that make the investment profitable.

Furthermore, actors who develop, design or build new nuclear power plants can be expected to generate experience that makes it easier and less costly to build the next nuclear power plant. The knowledge that a company generates can benefit other actors which is positive from a societal perspective. At the same time, this kind of knowledge leakage means that the company cannot capitalise on the full value of its efforts and that the private yield on the investment ends up being lower than the society's yield. From the society's perspective, to avoid too little being done in the form of knowledge-generating activities, government interventions may be justified. Patent legislation, support for research and development or investment aid are traditional instruments used to address some aspects of this problem. Over the past 20 years, many EU countries have also used feed-in tariffs or green certificates to increase the volume of renewable electricity generation and to promote the development of solar and wind power. Providing specific aid for the first investments in new nuclear power may be similarly justified.

Although conventional nuclear power is proven technology, for a long time the policy direction in Sweden has concerned operating and decommissioning existing nuclear power plants rather than promoting new investment. There have been direct obstacles during certain periods, such as the prohibition on the construction or preparations for the construction of nuclear reactors, as well as restrictions on the number of reactors that may be built and the sites where they may be located. This has restrained the drivers and opportunities for the development of new nuclear power and contributed to a shortage of qualified staff in government agencies as well as in companies. The re-establishment of skills and supply chains required for a new nuclear programme is anticipated to entail extra costs for the first actors who invest in new nuclear power.

The long investment horizon for nuclear power entails a major risk that the regulations and other conditions determined by policy will change. Central government financing of new nuclear power takes a clear stand for the continued electrification of industry and transport, and reduces the policy risk. As indicated in Section 4.1, over the longer term there are alternative development pathways that could facilitate higher electricity consumption for the electrification of industry and transport without the same proportion of plannable power as today, through the development of, for example, large-scale storage technologies. Uncertainty about technology development can be assumed to dampen private investors' will to invest. State aid that compensates for this uncertainty in the market entails a spread of risk from a societal perspective. A scenario without new plannable electricity generation, where storage and flexibility technologies are not developed in the way that some in the industry believe, will jeopardize the green transition of industry and transport.

Finally, nuclear reactors contribute significant benefits to the system for which no compensation is paid. These include voltage holding, frequency stability and market-sharing transmission capacity between the bidding zones.

The need for specifically adapted aid for nuclear power

A criterion in the design of the financing and risk-sharing model proposed in the memorandum was that it must contribute to a low cost of generating electricity relative to the capital cost of new nuclear power. A distinction needs to be drawn here between, on the one hand, the construction costs per se and, on the other hand, the additional financial costs resulting from risk premiums that reflect the uncertainty in the capital investment appraisal, but also the fact that the cash flow in the project during the construction phase is negative without exception. A long period for the construction means that more expensive financing also gives rise to a significant compound interest effect. A model for financing and risk-sharing cannot influence the construction costs per se, which are decided in negotiations between suppliers and purchasers in an international market. However, a well-designed financing and risk-sharing model can influence the cost of the financing which, in a nuclear project without risk-sharing, can account for up to two-thirds of the total cost of generating nuclear electric power. Different European countries have made different choices concerning how nuclear power should be financed and how risks in a project should be allocated between electricity generators, electricity consumers, and central government. The common denominator is that the state aid is designed based on the specific challenges facing nuclear power. The Government assesses that it is socio-economically efficient to design the state aid to benefit the types of power that can offer the wanted capabilities such as continuity of supply, etc. (see Section 4.1), that need to be added to the electricity system for it to function based on each type of power's needs. The risk of a technology-neutral approach is that the state aid does not adequately address the challenges of any specific type of power and that investments therefore do not materialise, or that the state aid is not effective. With regard to hedging arrangements, the Government argues that it is not feasible to design a single support scheme with hedging arrangements that is technology-neutral because in principle the CfDs need to be tailored to the hedging needs of each type of power.

In order to enable investment in new nuclear reactors at a reasonable cost in order to generate electricity, the Government – like others including *Vattenfall* and *SKGS,* but unlike others including the *Swedish Energy Agency* and *E.ON* – assesses that specifically adapted state aid is needed that addresses the risks surrounding investments in new nuclear power.

5 State aid for investments in new nuclear power

5.1 Aid is granted through loans and two-way CfDs

The Government's proposal: Aid may be granted in the form of central government loans and two-way CfDs.

The aid is designed to incentivise efficient resource utilisation in the construction, possession and operation of new nuclear reactors. The aid is also designed to ensure a judicious allocation of risks and earnings between central government and the beneficiary company.

The aid is subject to terms and conditions regulated in contract between central government and the beneficiary company.

These terms and conditions must take into account:

- central government's risk;
- central government's ability to assert its rights; and
- central government's needs for control and monitoring.

The memorandum's proposal accords in part with the Government's proposal. The memorandum's proposed Act does not contain provisions on the design of the aid. Nor does it state that the terms and conditions for the aid must be regulated in contract between central government and the beneficiary company. However, the model for the aid proposed in the memorandum does entail the conclusion of a contract between central government and the company.

Consultation bodies: *Fortum* is of the opinion that in principle the proposal covers most of the major risks from the investor's perspective, but that details and parameter values will be crucial. *Uniper* assesses that the proposed model is fundamentally appropriate and that, provided that the parameters have been judiciously chosen, it can create a good basis for investing in nuclear power. *Vattenfall* expresses the view that the components of the model are acceptable in principle, but contends that work remains to be done to further develop the different parameters in the model because they must be set and assessed as a unit based on the expected costs, and that this should be done at a later stage in the project development phase. Furthermore, Vattenfall sees a need for further measures to manage the programme risk and the regulatory risk. A number of the consultation bodies comment on the proposed parameter values, where the *National Institute of Economic Research* and the *Swedish National Debt Office* argue that the expected yield with the proposed parameters appears to be high, while the *Swedish Energy Markets Inspectorate* is of the view that whether or not the proposed level of state aid will be sufficient is uncertain. The *Confederation of Swedish Enterprise* is of the view that the proposed model offers an advantage in that a similar model for state aid has already been approved by the European Commission. The *National Agency for Public Procurement*

advocates flexibility in the design of the regulatory framework to make the proposal adaptable to the European Commission's requirement to approve the state aid.

The *Swedish Energy Agency* argues that in order to promote competitive tendering, the proposed parameter values should be disregarded and the focus should instead be on the technology model framework. The National Debt Office proposes that the terms and conditions are regulated as far as possible in statute rather than being left to negotiations.

Reasons for the Government's proposal

Aid is granted through central government loans and two-way CfDs

As outlined in the memorandum, investments in nuclear power are associated with economic risks. This leads to private investors requiring high yields on their investments. When central government co-finances and takes on risk in a project, the financing cost decreases, which is a prerequisite for being able to bring about investment in new nuclear power that can supply electricity at a reasonable cost to electricity consumers.

The memorandum's proposal for a financing and risk-sharing model contains three components to manage the most important risks with investment in new nuclear power: central government loans, a two-way CfD, and a risk- and earnings-sharing mechanism. The latter component operates through changed terms for the central government loans and the CfD and is thus tied to these two aid components (see Section 5.2).

The purpose of central government loans and two-way CfDs is to provide financial support at different stages of a project. Before the reactor comes online, the company receiving the aid, hereinafter referred to as the project company, has no revenue from selling electricity, which means that the capital costs need to be financed by loans and injections of equity. When the nuclear reactor comes online, the project company receives market revenues that can be used to cover operating expenses, amortise the central government loans, and distribute dividends to the project company's owners. Thus, the purpose of the loans is to grant aid for the capital costs, while the CfDs ensure a minimum remuneration to the project company during the commercial operation of the reactors and return any surplus earnings to central government.

Most of the consultation bodies whose view is that specific aid should target investments in nuclear power, including *Fortum* and *Uniper*, argue that the proposed model in principle addresses the most important risks in a nuclear power project. Some consultation bodies, such as *Vattenfall*, argue that there is a need for supplementary measures to address risks such as regulatory and programme risks. The Government considers that most of the additions to the scheme requested by the consultation bodies can be addressed, if necessary, by adjusting the terms and conditions of the loan agreements and CfDs. Furthermore, there are inquiries in progress to address risks that are not fully managed by the proposed model. One such example is the Government's remit to the National Debt Office (KN2024/01812) regarding the financing of the disposal of nuclear waste for the first investments in order to manage the programme risk.

In light of this, the Government's view is that aid should be granted through central government lending that is financed by loans in the National Debt Office, and through two-way CfDs.

Incentives for efficient resource utilisation and a judicious allocation of risks and earnings

The Government shares the assessment in the memorandum that incentives for economic efficiency and a fair allocation of risks are of great importance in the design of the aid, given the extensive commitment that the aid entails for central government. The aid has therefore been developed with these criteria in mind. As stated in the memorandum and as many of the consultation bodies point out, it is ultimately the more detailed design of the aid and the parameter values chosen that will be decisive. For example, in themselves the central government loans do not entail central government taking on a great deal of risk, but can entail this if the proportion of equity capital is too low. A CfD may be a disincentive for the project company to respond to market price signals, but such effects are mitigated if they are designed correctly. Several consultation bodies including the *National Institute of Economic Research* expressed views on the parameter values proposed in the memorandum and when they should be established. As the *Swedish Energy Markets Inspectorate* and others point out, the proposed parameter values in the memorandum are based on assumptions associated with considerable uncertainty, especially with regard to construction costs. As noted in the memorandum, the parameter values in the proposal need to be adjusted if the assumptions underlying them change, for example if construction or operating costs prove to be higher than assumed in the memorandum. Furthermore, the memorandum, along with the *National Agency for Public Procurement*, advocates flexibility in the design of the regulatory framework to permit adjustment of the aid if necessary to obtain European Commission approval for the state aid, which the Commission examines in each individual case when it comes to nuclear power projects. For these reasons and in contrast to, for example, the *National Debt Office*, the Government considers it inappropriate to regulate these conditions and parameter values in statute.

In order to provide clarity on how the aid will be designed, the Government assesses that certain basic principles should be established in statute. These include that the design should safeguard incentives to be resource-efficient, which can be affected by the share of equity capital and the possibility to influence the yield. This also entails designing the aid so that it provides a balance between the project company's needs and its options for generating a reasonable yield on the one hand, and central government's risk-taking and possibility to limit the scope for surplus earnings. The Government therefore proposes that the aid should be designed so that it provides incentives for efficient resource utilisation, and so that a judicious allocation of risks and earnings between central government and the project company is achieved.

The aid is subject to terms and conditions regulated in contract

The state aid for investment in new nuclear power will be granted by central government issuing loans to, and entering into two-way CfDs with,

a project company. The terms and conditions of the loans and the two-way CfDs should be regulated in private law contracts between central government and the project company. The terms and conditions are drawn up following negotiations between the parties. However, certain fundamental interests should always be safeguarded. The aid means that central government takes a risk. This risk should be balanced against society's need for the investment and the capacity of the company to implement the project. The assessed need for power may be important in terms of the appropriate size of the project. Furthermore, the choice of reactor technology may be important for assessing the project's feasibility and operational reliability, for example whether the technology is large-scale reactors or Small Modular Reactors (SMR), and whether light-water or a new technology is used. Central government needs to be able to recover the loans, for example, if the funds lent are used for purposes other than those specified in the loan agreement, or if the project company otherwise breaches any of the other terms and conditions in the contracts. The project company should have a duty of disclosure and the contracts also need to ensure that compliance with them can be verified. The Lending and Guarantees Ordinance (2011:211) contains provisions on the terms and conditions for central government loans and guarantees, referred to as the Swedish guarantee and lending model, which can serve as a prototype for certain terms and conditions to which that the aid for investments in new nuclear power should be subject. In light of this, the Government considers that the terms and conditions in the contracts should be regulated such that their design must take into account central government's risk, central government's ability to assert its rights, and central government's needs for control and follow-up. In addition, the design of the aid, which is expressed in the terms and conditions in the contracts, can take into account a number of other interests, such as ensuring that it is fit for purpose in relation to the needs of the electricity system and the electrification of society, and avoiding security policy risks arising.

5.1.1 Central government loans

The Government's proposal: Central government loans may be granted for the construction and test operation of new nuclear reactors, and for project planning and other preparatory measures for their construction.

The Government's assessment: The terms and conditions of central government loans should be based on the following:

- A framework loan that includes expected accrued interest expenses until the reactor starts commercial operation and a cost overruns buffer is issued to the project company.
- The share of debt capital is determined at a level that maintains the shareholders' incentives to achieve an efficient utilisation of resources with limited risk-taking, while at the same time keeping the financing cost low enough for investment to occur.
- The interest rate on the central government loans is subsidised compared to the expected cost to central government.
- The loan terms and conditions are adjusted to provide incentives to replace the central government loans with private loans earlier than the projected operational life and take into account the company's prospects of obtaining market financing on reasonable terms.
- The loans are disbursed to the company as its expenses arise.
- The loans are repaid within the projected operational life.
- The company receiving the loans may not transfer value or provide variable remuneration to senior executives of the company before the nuclear reactor is in commercial operation.
- How the borrowed amounts are used is monitored regularly.

The memorandum's proposal accords in part with the Government's proposal and assessment. The proposed Act in the memorandum contains an information provision concerning the provisions in the Budget Act that govern interest rates and fees for loans. The proposed Act does not specify what the loans may be used for. The memorandum's other proposals concerning central government loans are based on the same principles but contain a more detailed and parametrised design for the loan terms and conditions. Furthermore, the prohibition on profit transfers in the memorandum is linked to the risk- and earnings-sharing mechanism.

Consultation bodies: A number of the consultation bodies including *Swedenergy, SKGS*, the *Confederation of Swedish Enterprise, Technology Industries of Sweden* and *LO* are in favour of central government loans being used to lower the financing cost, and some of these bodies have views on the design. *LTU* views it as positive that the borrowed amount cannot be used for profit transfers or bonus programmes before the first valuation of the company is made.

Vattenfall AB considers that financing a project without an upper limit for equity will be challenging, that dividend restrictions during the operational phase can result in inefficient capital allocation, and stresses the importance of predictable commercial loan terms after the start of commercial operation. Vattenfall also contends that the costs for project development up until the licence is obtained, such as for the detailed design of the plant site, detailed development planning of the construction

project and local adaptations of the power plant to Swedish conditions, are not addressed in the proposed model. *Blykalla AB* argues that the fuel cost should be classified as a construction cost and therefore able to be financed with the loans. *Rolls-Royce SMR* holds the view that the interest rate on the central government loans should not be increased until all reactors in a project come online, and that loan disbursements should be linked to progress steps in manufacturing of the components. *IFN* is critical of the interest rate being subsidised and argues that the interest rate should be determined at a market level in order to avoid socio-economically unprofitable projects or that the capital is utilised inefficiently. The *National Debt Office* holds the view that the Government should consider requiring a shorter repayment period than the projected operational life, provide stronger incentives to replace central government loans with market financing, and that the conditions for early redemption of loans should be clarified.

Reasons for the Government's proposal and assessment

Loans may be granted for the capital costs of new nuclear reactors

Before commercial operation, uncertainty about the project's future profitability is particularly high and private lenders therefore require a significant risk premium. In accord with the memorandum, the Government assesses that it is not possible to achieve profitability in Swedish nuclear power projects without reducing the financing cost during the investment phase in relation to what would be achievable with market financing. Central government loans reduce the financing cost, and thus the cost of generating nuclear electric power, in two main ways. Central government loans enable a capital structure with a higher proportion of debt capital than can be obtained on market terms during the investment phase, and at a lower interest rate than the market. By issuing loans to a project company that is separate from the other activities of the owner companies, the yield required by the owners of the project company is also reduced because the owners are only risking invested equity.

The memorandum stays at a general level regarding what the loans may be used for, i.e. for investment in new nuclear power. In order to define more clearly what the loans may be used for, the capital costs should be divided up into the different phases of the project. Guidance can be obtained from the Nuclear Activities Act (1984:3), which uses the terms construction, possession and operation. The legislative history of the Nuclear Activities Act also divides the term 'operation' into test operation and commercial operation to describe the different stages of the licence application process. This has also been established practice in Sweden regarding the construction and commissioning of nuclear power plants, and is also applied internationally. The Government decides on licences for construction, possession and operation, but a step-by-step examination by the Swedish Radiation Safety Authority then follows, which means that the actual construction may not begin until the Swedish Radiation Safety Authority has given its consent. In addition, consent from the Swedish Radiation Safety Authority is required before the reactor starts test operation and before commercial operation. The term 'construction' refers to the actual building of the reactor after a licence has been obtained under

the Nuclear Activities Act and the Swedish Radiation Safety Authority has given its approval. Test operation is the phase in the establishment of a new nuclear reactor when the reactor is loaded with nuclear fuel and tests are run. At this point, it has not yet received all the necessary licences from the Swedish Radiation Safety Authority to be able to operate at full capacity. Only when the reactor has completed test operation with approved results can the Swedish Radiation Safety Authority approve the start of commercial operation, i.e. full power (Govt Bill 1983/84:60 pp. 194–196). The Government considers that, since it is not until commercial operation that the reactor is permitted to operate in a way that enables it to generate revenues corresponding to its full capacity, the investment phase should be deemed to include the period of test operation. *Blykalla* points out that some reactor types require that fuel for the entire reactor's operational life is loaded into the reactor already in the test operation phase and that it should be possible for this entire cost to be financed from loans. The Government's view is that the nuclear fuel that needs to be inserted to carry out test operation should be considered part of the capital cost. If, for certain reactor types, this means that fuel for the reactor's entire operational life must be supplied before it generates revenue, it may be reasonable to finance the cost with a loan.

In addition to capital costs during construction and test operation, a company investing in new nuclear power can be expected to incur substantial costs even before construction begins, which *Vattenfall* points out. These costs are the costs of project planning and other preparatory measures, meaning the measures required on-site before the construction of the reactor can begin, as well as preparations related to the ordering and manufacture of components from suppliers. Examples of such measures are site preparation measures such as blasting and excavation works, electric wiring, establishment of the necessary infrastructure on the site for the construction, and logistics and transport for these measures. Other examples include investigation and preparatory works for the construction of the reactor, such as detailed design and adaptations of the selected reactor model, as well as planning and logistics for the construction of the reactor. The investment phase should therefore be deemed to include such preparatory measures.

The Government's view is that loans should be granted for the various parts of the investment phase before the reactor can generate sufficient revenue from the sale of electricity to finance the project company's costs. This should include the costs of project planning and other preparatory measures that are incurred from the time the project company applied for aid. This means that these costs are initially financed with injections of equity but – where a decision is made to grant aid – they are taken into account by the project company's owners needing to contribute less equity in order to achieve a given apportionment between debt and equity capital.

In light of this, the Government proposes explicit regulation that loans may be issued for the construction and test operation of new nuclear reactors, and for project planning and other preparatory measures for their construction.

The framework loan includes scope for interest expenses and cost increases

After obtaining approval from the Riksdag and in connection with aid being granted, the Government should decide to issue a framework loan to the project company in the National Debt Office for the purpose, up to a maximum amount. Within this framework loan, the project company raises loans as the need arises to finance the capital costs in the project. Interest is paid only on the portion of the framework loan that is utilised.

Until such time as the reactor comes online, the project company generates no revenue. In order to reduce the effect on cash flow for the owners of the project company, in accord with the memorandum the Government assesses that interest should not be paid during the investment phase, but instead accumulate and be added to the loan amount. Furthermore, the Government shares the assessment in the memorandum that a necessary condition for attracting investors is that the project company is guaranteed financing on predictable terms even in scenarios where the project goes over budget. *Vattenfall* contends that the proposal in the memorandum where a ceiling is set for the model at a level corresponding to a 100% cost overrun is not sufficient, given that nuclear power projects have historically incurred higher cost overruns. The Government shares the assessment in the memorandum that a partial explanation of high-percentage cost overruns in previous projects has been an overly optimistic assessment of the starting values in the project's costings. The Government believes that such experiences should be taken into account in the cost estimate, which can reduce the need for a large buffer against cost overruns. However, unlike the proposal in the memorandum, the Government does not consider it appropriate to set a ceiling in advance at which point the financing and risk-sharing model will definitively cease to apply. The absence of a ceiling does not give the Government greater powers, since increases in the framework loan require the Riksdag's approval in any case. The framework loan for the project company should therefore include the expected accrued interest expenses until such time as the reactor starts commercial operation, as well as a buffer against cost overruns.

Capital structure for lower financing costs while maintaining incentives for efficiency and limited risk-taking

Capital structure refers to how a company finances itself with debt contra equity capital. Shareholders' claims to a company's cash flows are subordinate to lenders, and therefore typically require a higher yield than a lender would require for loans to the same company. From an owner's perspective, a high proportion of debt capital in the form of central government loans is advantageous because, given an unchanged interest rate on the central government loans, it lowers the total cost of capital for the project. The cost is lower because, by subsidising the interest, central government is not compensated for the higher credit risk that a larger proportion of debt capital entails.

When choosing an appropriate capital structure, a balance needs to be struck between achieving a low financing cost for the project on the one hand and limiting central government's risk-taking on the other. Too low

a proportion of equity capital may give rise to excessive risk-taking in the project because negative outcomes will have a limited impact on the shareholders. Too high a proportion of equity capital may prove challenging to finance from the project company owners' existing investment budget. This may mean that injections of equity in the project company need to be largely financed by borrowing on the market, which can negatively affect the owners' credit rating and the borrowing cost for their other activities. In addition, equity capital is a more expensive source of financing than central government loans, which means that, all else being equal, the generation cost increases with a higher proportion of equity capital.

The Government assesses that the most appropriate course of action is to establish the capital structure on a case-by-case basis, based on the project's specific circumstances. A project that is assessed as having a high business risk, for example because it is based on a reactor technology with a low level of maturity, may motivate a higher proportion of equity capital, and vice versa. The choice of an appropriate capital structure also depends on the size of the project. For a larger project, a lower proportion of equity capital than the 25% proposed by the Inquiry may be sufficient to ensure that incentives are well-targeted, while a smaller project may require a higher proportion than the one proposed in the memorandum to achieve the same effect. The Government assesses that when determining the capital structure, preserving the owners' incentives to utilise resources efficiently should be prioritised, and limiting risk-taking in the project, which in practice limits the proportion of debt capital that may be relevant.

Vattenfall contends that it is challenging to finance a project without any limit on how much equity capital should be invested in the project, especially for the first nuclear power project, which will have costs that are difficult to forecast accurately. The Government assesses that this can be addressed within the proposed model, for example by a lower proportion of equity capital in the case of cost overruns, which differs from the Inquiry's proposal which recommends a constant capital structure. However, the principle should still apply that the project owners contribute an equity stake that is in total sufficient to preserve incentives for the project to be efficient.

Subsidised interest rates with incentives to phase out central government loans over time

In order to lower the cost of capital, especially during the investment phase when the yield required by private lenders is high, the Government assesses that the interest rate on central government loans should be subsidised compared to the expected cost to central government. According to the guarantee and lending model, this means that the difference between central government's costs for the loan and the interest charged to the project company needs to be financed in another way. Usually, funds are earmarked for grants and the portion corresponding to central government's expected loss is transferred to a credit reserve, an account in the National Debt Office. The losses recorded are covered by funds from the account (Chapter 6, Sections 4 and 5 of the Budget Act). The proposed Act in the memorandum includes a proposed information

provision stating that for aid given in the form of loans, the Budget Act contains provisions governing the charging of interest and fees. The Government assesses that such an information provision is unnecessary. The provisions in the Budget Act apply.

Some consultation bodies including *IFN* are of the view that a subsidised interest rate could lead to the capital being utilised inefficiently. The Government argues that the components and parameter setting in the model need to be seen as a whole. The terms and conditions of the CfD are determined by taking into account the loan terms and conditions in order to provide a reasonable, risk-adjusted yield on the equity capital invested in the project company. All else being equal, more favourable loan terms should result in a lower strike price in the CfD or a shorter life with retained expected yield. The calculations presented in the memorandum illustrate that the yield in the project company is sensitive to cost overruns and delays. The Government therefore assesses that there are still strong economic incentives to carry out the project on time, and at as low a cost as possible, even with favourable interest terms.

The memorandum does not include any proposals on the pace at which the central government loans should be disbursed. The project company should, of course, have a vested interest in matching its borrowing to the capital costs arising in the project in order to minimise its financing costs rather than raising loans long before these costs arise. But it cannot be ruled out that the project company will perceive other benefits in taking out central government loans earlier than is motivated, for example if it is possible to get a yield on the borrowed funds that exceeds the financing cost. In addition, central government borrowing and the management of central government debt need to be given conditions that allow them to be carried out as efficiently as possible while avoiding unnecessary prepayments. The Government's view therefore is that there is reason to clarify that the default position is that the loans should be disbursed as the project company's capital costs are estimated to arise. *Rolls-Royce SMR* proposes that disbursements of central government loans should be linked to the manufacture of components and not just to construction site milestones in the project. The Government assesses that the project company's liquidity needs at the time of construction should determine disbursements of the loans, and that the contract between the project company and the supplier steers the payment flows between them.

Like the memorandum, the Government assesses that the loans should be repaid within the projected operational life of the new nuclear reactor or reactors, calculated from the time they start commercial operation. The projected operational life depends on the reactor model among other things, which is why the repayment period for the loans may vary between different projects. There may also be other reasons for negotiations between central government and the project company resulting in a shorter repayment period, for example to reduce the credit risk in a project, which the *National Debt Office* argues should be considered.

When the nuclear reactor is commissioned and starts generating cash flows, the conditions for the project company to borrow on the open market ought to be significantly better than during the investment phase. The Government therefore assesses that incentives should be provided to replace the central government loans with market financing earlier than

the projected operational life, for example by gradually stepping up the interest rate on the central government loans, as proposed in the memorandum. Such an approach would mean an expectation that the central government loans are repaid at a faster rate than the mandatory amortisation rate established in the loan agreement. The Government shares the *National Debt Office's* assessment that the terms and the basis for early redemption of central government loans should be clarified before the loans are issued.

Vattenfall contends that it is crucial to assess the project's ability to finance itself on the external capital market before the interest rate is raised to levels that penalise the project company if alternative financing does not exist. The Government agrees with the assessment that the phasing-in of a higher interest rate on central government loans should take into account the project company's ability to secure market financing on reasonable terms. For example, a prerequisite for increasing the interest rate on central government loans above a contracted level could be that the project company has attained a certain credit rating. Such an arrangement could enable a faster stepping-up of the interest rate on the central government loans, which the *National Debt Office* recommends, while also providing protection for the project company in scenarios where market financing is not available on reasonable terms.

Rolls-Royce SMR argues that stepping up the interest rates on central government loans should only begin once all the reactors in a project have come online. The Government assesses that it is possible to make adjustments in the loan agreements to respond to the specific conditions in SMR projects, i.e. projects involving small modular reactors where the project probably involves several reactors at the same site. This should be decided on a case-by-case basis in negotiations between central government and the project company.

One option for accelerating the transition to market financing is to limit the life of the loan in the loan agreement to a period that is shorter than the projected operational life. This would reduce the need for a gradual stepping-up of the interest rate and contingent loan terms that, according to the National Debt Office, makes it difficult to estimate central government's financing costs. Moreover, a shorter life for the central government loans without such terms makes future financing costs for investors more predictable, which in some cases may be more valuable than a longer life for the loan. It is also worth noting that earlier aid models with central government loans that have been approved under the state aid rules have had a life significantly shorter than the projected operational life. The Government therefore assesses that whether or not a shorter life for the loan is a better option to achieve an earlier transition to market financing, than to use a longer life in combination with a phasing-out mechanism should be assessed on a case-by-case basis.

Tracking of funds used and restrictions on value transfers from the company

As in the memorandum, the Government's view is that the utilisation of the framework loan should be tracked to ensure that the funds lent are not used for purposes other than the capital costs of the new nuclear reactors

to which the aid relates. Furthermore, in the memorandum it is proposed that the amount lent may not either be used for profit transfers or bonus schemes for senior executives of the company prior to the first valuation of the company, which regulates the risk- and earnings-sharing mechanism. It is proposed that the same applies during periods when the risk- or earnings-sharing mechanism is activated. *Swedenergy* and *LTU* view this as reasonable. The Government considers that the term 'value transfer', as defined in Chapter 17, Section 1 of the Swedish Companies Act, captures the various transfers of funds from the company that should not be permitted in a better way than profit transfer. Besides dividends, other events in the business that result in the company's wealth being reduced are also included, without the event necessarily being purely commercial in nature. Unlike the memorandum's proposal, the Government does not consider that such restrictions should necessarily have a direct link to the risk- and earnings-sharing mechanism. Instead, the Government assesses that value transfers from the company and bonus programmes should be permitted after a reactor starts commercial operation. It is at this point that earnings can be generated and it is reasonable for dividends to be permitted. On the other hand, there may be reason to limit, in the terms of the central government loans, the size of dividends that can be paid to the owners of the project company during periods when the risk- and earnings-sharing mechanism is activated.

IFN argues that there is a risk that transfer pricing will be used to transfer a surplus from the project company to other companies within the same group. The Government assesses that the proposed model, with parameter values appropriately set, provides a good basis for incentives to be well-targeted without requiring extensive monitoring of the project. With a significant equity stake, the owners of the project company should have an economic interest in keeping costs down, as the yield would otherwise suffer. Considering the size of the commitment, it is likely that the project company will have more than one owner, which provides natural incentives for minority shareholders to monitor and ensure that the capital is utilised in the best interests of the project company. Nevertheless, it cannot be ruled out that in projects with a more concentrated ownership structure there may be a risk of covert dividends between the project company and its owners via transactions not on market terms. Therefore, the Government assesses that there should be regular inspections of how the borrowed amounts are used.

5.1.2 CfDs

The Government's proposal: Two-way CfDs may be entered into for the commercial operation of new nuclear reactors.

The Government's assessment: As a starting point, the contractual terms and conditions should be designed as follows:

– The CfD is financial, and the compensation to and from the company and central government is regulated by multiplying the difference between a strike price and the average market price in the bidding zone where the reactors are located, by a reference capacity.

- The company's incentives to act on the electricity market's price signals are preserved.
- It takes into account the needs emanating from electrification, such as the need for price hedging for other actors.
- The maximum remuneration per calendar year is set.
- Parameters such as contract length and strike price are adapted to suit the circumstances of the individual project in order to create predictability for investment while the economic risks for central government and the electricity customers are deemed reasonable in relation to the benefits.

The provisions governing two-way CfDs in the new Article 19d in Regulation (EU) 2019/943 of 5 June 2019 on the internal market for electricity are directly applicable and do not need to be detailed in a separate provision in the proposed Act.

The memorandum's proposal accords in part with the Government's proposal and assessment. The memorandum's proposed Act does not specify the purpose of the CfD but contains an information provision stating that the CfDs must be designed in compliance with the provisions in the EU's Electricity Market Design Regulation. The memorandum contains numerical proposals for CfD parameters such as duration, strike price and reference capacity. The memorandum also contains a proposal on the financing of central government's commitment under the CfD.

Consultation bodies: The *Swedish Competition Authority*, the *Swedish Energy Markets Inspectorate*, *Swedenergy*, *SKGS* and the *Confederation* of *Swedish Enterprise* and others are in favour of the CfD being financial and thus largely preserving the market signals for daily operations. *Technology Industries of Sweden* and others stress that the level of the strike price needs to be reasonable for Swedish households and businesses. Technology Industries of Sweden welcome the fact that the average price in the electricity generator's bidding zone on the day-ahead market is used to determine the reference price.

The *Swedish Energy Agency* would like to see further evaluations of alternative designs for the CfDs. *Svenska kraftnät*, the *Swedish Energy Markets Inspectorate*, the *Swedish Energy Agency, Vattenfall, Fortum* and others expressed views on the details of the design, for example how the reference capacity is to be calculated. A number of consultation bodies, including Svenska kraftnät, the Swedish Energy Markets Inspectorate, Vattenfall and the Confederation of Swedish Enterprise, question the parameters proposed in the memorandum, including the size of the strike price, or see them as indicative. *IFN, E.ON* and others contend that a ceiling on the total remuneration from the CfD should be considered in order to reduce the risk for central government and electricity consumers. *Uniper* and others argue that an annual regulation could result in a significantly impacted cash flow for the company should electricity prices be low. Uniper proposes that the duration be calculated from the actual start of commercial operation, rather than the planned start, as this company argues that there are already clear incentives to keep to schedule for the stated start of commercial operation. The Swedish Energy Markets Inspectorate, Svenska kraftnät and the Swedish Energy Agency are all of

the view that the impact on the financial markets needs to be taken into account in the design of the CfDs moving forward. The Swedish Energy Agency and the Swedish Energy Markets Inspectorate and others share the view that the motives behind and consequences of implementing the memorandum's proposal need further investigation. *LO* agrees with the memorandum's proposal regarding the financing of the CfDs. The Confederation of Swedish Enterprise argues that the issue of financing should be investigated further, and Vattenfall would like to see an impact assessment of relevant financing alternatives. *SKGS* and others hold the view that a tax to finance central government's expenditure on CfDs must be designed to take into account the industry's competitiveness and to ensure that incentives for flexible consumption are not undermined.

Reasons for the Government's proposal and view

Two-way CfDs may be concluded for commercial operation

The identified market risk for investment in new nuclear power must be adequately and appropriately addressed to facilitate new investment (see Section 4.2). Otherwise, the market risk would burden the capital investment appraisal for nuclear power too much due to the long time horizons over which the project operates and the considerable investments required for new nuclear power. The Government therefore assesses that state aid for investment in new nuclear power also needs to include commercial operation of the new reactors. Commercial operation refers to the phase in which the reactor has a licence to operate at full power.

In 2024, Regulation (EU) 2024/1747 amending Regulation (EU) 2019/943 of 5 June 2019 on the internal market for electricity, referred to as the Electricity Market Design Regulation, came into force. The new Article 19d identifies two-way CfDs as an instrument for direct price support for certain types of electricity generation, including nuclear power. In the Regulation, a two-way contract for difference (CfD) means a contract between a power-generating facility operator and a counterpart that provides both minimum remuneration protection and a limit to excess remuneration. Under the new provision, all systems involving direct price support in the form of two-way CfDs are to be designed to preserve incentives for the power-generating facility to operate and participate efficiently in the electricity markets, in particular to reflect market circumstances. Furthermore, the design must ensure that the level of the minimum remuneration protection, and of the upward limit on excess remuneration, are in alignment with the cost of the new investment and the market revenues. This is to guarantee the long-term economic viability of the power-generating facility while avoiding excess remuneration. When assessing two-way CfDs in light of the state aid rules under Articles 107 and 108 of the Treaty on the Functioning of the European Union (TFEU), the European Commission is to ensure compliance with principles for the design of two-way CfDs.

In order to preserve the electricity market's price signals as far as possible to promote efficiency and stability in the electricity system, the Government proposes that state aid during the operational phase be designed as two-way CfDs, which create greater predictability in terms of market revenues. This aid is to be designed in accordance with Article 19d

of the Electricity Market Design Regulation. However, unlike the proposal in the memorandum, the Government's view is that there is no need for an information provision concerning this, since the Government notes that an EU Regulation is directly applicable in Sweden and it is the Government that must decide on aid.

The CfD is financial and is designed to preserve market signals and meet the need for electrification

When designing CfDs in compliance with the provisions in the EU's Electricity Market Design Regulation, a number of criteria must be met, including preserving the incentives to react to market signals. Furthermore, the CfD is to be two-way in the sense that payments are to be transferred in both directions between the contracting parties, depending on whether the market price has been higher or lower than the strike price. As was concluded in the memorandum, the CfD must also be designed to ensure that its purpose – to enable the establishment of new energy production – is achieved.

A CfD can be production-based or financial. A production-based CfD generally means that the generator gets an income equal to the strike price for each unit of energy produced. With a financial CfD, the revenue is instead calculated based on a predetermined reference capacity and an average market price. In order to reconcile the aspects highlighted in the Electricity Market Design Regulation, in accord with the memorandum the Government assesses that a financial CfD is appropriate. The objective of the aid is achieved by reducing the market risk and contributing to an adequate expected yield on invested capital. Thus, the remuneration paid under the CfD should be based on a reference capacity, a strike price, and the average market price. This increases predictability for electricity consumers and generators while preserving market incentives as far as possible.

A financial two-way CfD for nuclear power usually involves determining the amount of compensation based on the following:

– The nuclear power generator sells electricity on the open market, for which it gets the market revenue.
– After a certain period of time, the average market price is calculated. If the average market price is below the strike price, the nuclear power generator is compensated by central government in the amount of the difference multiplied by a reference capacity. The reference capacity is set based on the projected generation from the nuclear power plant. If the average price is above the strike price, central government is compensated by the nuclear power generator in the amount of the difference multiplied by the reference capacity.

The *Swedish Competition Authority* argues that it is positive that the CfD is designed with parameters that are retrospective and calculated on an annual basis, and that the compensation is determined on the basis of expected utilisation of capacity to minimise the impact on generation decisions. The Government shares the view that the remuneration payable under the CfD is thus largely unrelated to the generator's actions.

A number of consultation bodies, including *Uniper* and *Vattenfall*, see potential problems with an annual settlement time tied to the company's liquidity. The Government argues that the calculation of the level of remuneration should be determined for a period corresponding to a calendar year, among other things because central government expenditure is budgeted on an annual basis. This does not rule out that it may be appropriate for the compensation to and from the contracting parties to be paid more frequently based on estimated levels, with a final settlement in relation to the annual outcome.

The market price on which the average is to be calculated should be the prices on the day-ahead market for the bidding zone in which the generator is located. The reason for this is that the day-ahead market is the main market for electricity trading in the Nordic countries. The prices on the market are therefore the best approximation of market revenue. The reason for using the bidding zone in which the generator is located to calculate the reference price is that the revenue the generator receives from the market depends on the bidding zone in which the electricity is generated.

The *Swedish Energy Agency*'s view is that the impact on the financial markets needs to be taken into account in the design of the CfDs moving forward. The Government shares this assessment that the impact on the financial markets should be taken into account in the design moving forward, as well as other needs arising from society's electrification. For example, this might concern industry's need to sign hedging agreements to facilitate the transition and electrification of industry.

Against this background, the Government assesses that the starting point should be that a CfD is financial and designed to preserve market signals and that the needs due to electrification should be taken into account in the design of the contract.

A balance should be struck between predictability, risk and benefit for the individual project

Swedenergy, Vattenfall and others see a two-way financial CfD as an appropriate instrument to manage the market risk for new nuclear power, but their view is that the questions of specific levels and terms and conditions in the CfD should be addressed later in the process. The Government shares the assessment that the detailed design of the CfD needs to be able to take into account the circumstances of the individual project. What is an appropriate design may therefore differ depending on, among other things, reactor type, location, the size of the project and its time span. The specific parameters, such as strike price, reference capacity and duration, as well as other terms and conditions in the CfD, will thus be subject to a formal state aid investigation procedure carried out on the basis of each individual project. This also applies to terms such as how the reference capacity is to be calculated, whether the duration of the CfD refers to the time from the estimated or actual start of commercial operation, and the options for trading in two-way CfDs and on the financial markets. That the details are regulated in project-specific contracts once the circumstances are known is therefore motivated.

Svenska kraftnät points out that the benefits of nuclear power vary somewhat depending on location and that the strike price in the CfD should

reflect this. The Government argues that, when considering the application, it is able to assess the aid levels that are justified and what terms and conditions are appropriate for the individual project. Different levels may be justified by such factors as the project's contribution to the electricity system due to, for example, its location, the schedule for the project's implementation and the risk the project poses to central government and electricity consumers with regard to how the strike price and the volume in the CfD relate to future market prices, demand for electricity, and the electricity system's needs.

When establishing the CfD duration, a balance needs to be struck between the duration of the commitment and the level of the strike price, as a shorter duration entails a higher degree of uncertainty for investors and thus higher risk premiums. At the same time, future revenues are worth more the earlier they arise, and consequently predictability early in the operational phase carries more weight in the capital investment appraisal than revenues that arise further in the future.

IFN, E.ON and others contend that a ceiling on the total remuneration under the CfD should be considered in order to reduce the risk for central government and electricity consumers. The Government shares the assessment that the maximum remuneration per calendar year should be set in order to reduce the risk of excess remuneration should prices in the market turn out to be very low.

The Government therefore assesses, in contrast to what the memorandum proposes, that parameters need to be adapted to the circumstances of the individual project in order to create predictability for investment while the economic risks for central government and electricity customers remain reasonable in relation to the benefits.

Financing of the CfD

The memorandum proposes that initially a tax should be introduced, proportionate to the volume of electricity consumption, to finance central government's expenditure for the CfD and that as far as possible the tax should apply to the entire Swedish electricity customer collective.

LO agrees with the memorandum's proposal and stresses that it should also apply to electricity-intensive industry, which is exempt from electricity tax, as electricity-intensive industry accounts for the majority of future electricity demand. The *Confederation of Swedish Enterprise* points out that a new tax in the form of an excise duty on electricity consumption must comply with the EU's Energy Taxation Directive and Excise Duty Directive, and that it is important to design a solution that enables alignment between revenues and expenses. The Confederation of Swedish Enterprise argues that the issue of financing should be further investigated, among other things in order to analyse the legal situation at EU level. *SKGS,* the *Swedish Forest Industries Federation* and *Technology Industries of Sweden* hold the view that the design of an excise duty to finance central government's expenditure for CfDs must have regard to the competitiveness of the industry and ensure that is does not undermine incentives for flexible consumption. *Vattenfall* would like to see an impact assessment of relevant financing options since a tax on

electricity will result in a higher cost per kWh consumed and risks discouraging electrification.

The Government's view, which is similar to that expressed in the memorandum, is that a starting point should be that the cost is allocated based on the benefits that arise. One possible way to achieve this is to allocate the cost in proportion to electricity consumption. At the same time, the Government agrees with the Confederation of Swedish Enterprise's comment that the legal situation at the EU level needs to be clarified. The Government also agrees that Sweden's competitiveness must be safeguarded. The financing should also take into account the efficiency of any tax levied. Compliance with the provisions in the Electricity Market Design Regulation also need to be assured. Among other things, the Regulation states that central government's revenues collected from the CfD must be used either to finance the costs for direct price support schemes for electricity generation, be invested in measures that reduce the costs for final electricity customers, or otherwise be distributed to final electricity customers.

This Bill does not in itself have any economic consequences. Regarding the financing of the CfD, the Government intends to return to this in connection with proposals concerning financial powers.

5.2 A risk- and profit-sharing mechanism is applied

The Government's assessment: The terms and condition in the loan agreements and CfDs should also include a risk- and earnings-sharing mechanism. As a starting point, the mechanism should be designed as follows:

- The risk- and earnings-sharing mechanism regulates how the risk of a negative outcome is allocated between the project company and central government.
- The terms and conditions in the central government loans and the CfD are adjusted as necessary so that, after the risk- and earnings-sharing mechanism has been terminated, the yield on all or part of the invested equity capital in the company is within a predetermined range.
- The range and other conditions for the risk- and earnings-sharing mechanism are designed so as to preserve incentives for efficiency in the implementation of the project.
- The expected yield and the yield range are proportionate to the risk involved in the investment, taking into account the protection that the owners of the project company acquire through the risk- and earnings-sharing mechanism.
- Where necessary, the risk- and earnings-sharing mechanism can distribute earnings above a predetermined level between the project company and central government even after the repayment of the central government loans and the expiry of the CfD.
- The risk- and earnings-sharing mechanism is activated and is terminated based on assessments of the yield on invested equity

capital in the company, on the basis of a pre-determined valuation method.
– The number of assessment points, the timing of these, and the valuation method used are regulated in contract.

The memorandum's proposal accords in part with the Government's assessment. The memorandum proposes that an independent valuer makes a market valuation of the equity capital in the project company at a given point in time, and that its valuation determines whether the risk- and earnings-sharing mechanism should be activated. Furthermore, the memorandum proposes specific parameter values and procedures for how the threshold values should be calculated and how the value of equity capital in the project company is restored.

Consultation bodies: *SKGS,* the *Swedish Forest Industries Federation* and *Technology Industries of Sweden* argue that the mechanism plays an important role in reducing the policy risk and ensuring that parameters such as the strike price in the CfD are achievable. *Vattenfall* is of the view that a guaranteed minimum yield in combination with earnings sharing is an effective way to share the construction risk, but argues that it must be possible to achieve a commercial yield should the cost overruns be beyond the project's control. A number of consultation bodies, including *Fortum*, *Kärnfull Next AB (Kärnfull Next)* and *Swedenergy*, express the view that the basis for the valuation needs to be transparent and well-defined in advance. *Uniper* and the *Confederation of Swedish Enterprise* argue that a regularly recurring valuation could reduce the uncertainties. *LO* sees it as difficult to hit upon an optimal strike price in the CfD, and therefore sees earnings sharing as justified, but considers that a better and simpler solution is that reactors are built in a wholly state-owned enterprise. *IFN* assesses that the project's incentives to build quickly and at low cost are impaired and suggests that the risk- and earnings-sharing mechanism only takes into account external factors that the project company cannot influence. The *Swedish Competition Authority* welcomes the proposal creating scope for rewarding efficiency, but argues that the yield range appears to be too narrow.

Reasons for the Government's assessment

The need for a risk- and earnings-sharing mechanism

It is not possible to rule out that the project company will face long-term profitability problems at the start of commercial operations if major cost overruns or delays have occurred during the construction phase. Given that only a few nuclear power projects have been implemented in Europe in recent times, and that time and cost overruns for some of these projects have been high, the yields required by investors are high in the absence of risk-sharing. A mechanism to share the risk of adverse project outcomes helps to lower the owners' yield requirements and thus the cost of producing nuclear electric power. For example, risk sharing in the event of adverse outcomes may help in negotiation the strike price in the CfD at a lower level than would have been required without such a component in the model. Through an earnings-sharing mechanism, central government

and the electricity consumers, who bear the risk of adverse outcomes, also share in the earnings in the event of good project outcomes.

As several other consultation bodies including *LO* and *Vattenfall* point out, at the time the contracts are to be concluded, there may still be considerable uncertainty surrounding the project's revenues and expenses, making it challenging to set parameter values for CfDs and central government loans that will stand the test of time. In the absence of a review later in the project, this may mean that the project company receives a yield that is significantly lower or higher than the expected yield. Given a risk- and earnings-sharing mechanism that operates through the two forms of aid, the negative consequences can be reduced if the initially negotiated terms are set too strictly or too generously.

In its investigation of other countries' state aid models for nuclear power, the European Commission has attached great importance to adequate mechanisms being in place to prevent excess remuneration. The support schemes for nuclear power approved by the Commission in the United Kingdom and the Czech Republic include mechanisms for sharing earnings above a predetermined level between the beneficiary and central government. The Government assesses, in accord with the memorandum, that the model must include an earnings-sharing mechanism in order for the support to be approved in a future state aid investigation.

Against this background, the Government's view is that the terms and conditions in the loan agreements and CfDs ought to include a risk- and earnings-sharing mechanism.

Amended terms and conditions to achieve a predetermined yield range

Several of the risk-sharing models in use or planned in other countries focus primarily on managing cost overruns during the construction phase. However, as stated in the memorandum, exceeding the schedule or budget need not necessarily result in long-term profitability problems. Similarly, there are no guarantees that a project that has kept to its schedule and budget will be profitable in the long term. The Government therefore assesses, in accord with the memorandum, that it is efficient for the risk and earnings sharing to ensure that the project company's owners receive a return that is within a predetermined range. The range is defined by a lower and upper limit for the average accumulated internal rate of return (IRR) on all or part of the invested equity in the project company, until the termination of the risk- and earnings-sharing mechanism.

In order to fall within the yield range, the interest rate on the central government loans and the strike price in the CfD are adjusted for a certain period of time. If the yield falls below the range's lower limit, the terms are made more favourable, while they are tightened if the yield exceeds the upper limit. The purpose of the risk- and earnings-sharing mechanism is to restore the yield over time to within the range, rather than precisely regulating the yield for each individual year When the risk- and earnings-sharing mechanism is activated, any dividends paid by the project company must also be taken into account, i.e. situations where the project company's owners realise all or part of the return on their investment.

Incentives for the efficient implementation of the project must be preserved

Several consultation bodies, including the *Swedish Competition Authority* and *IFN*, expressed views on the memorandum's proposal concerning how a limit on possible yield outcomes affects the incentive structure and risk-taking in a project. The assessment in the memorandum is that a risk-sharing model that materially reduces the risk of the worst outcomes, but where the project owner still bears the risk of other negative outcomes, provides the best balance between required yields, efficiency and central government's risk-taking. The Government shares this assessment.

The precision of incentives is affected by the details in the design of the mechanism as well as by the specific parameter values established for a project. The memorandum proposes that the yield that can be obtained by the project company's owners should be affected by the extent of cost overruns during the construction phase, where cost increases above a certain level lead to negative yield. Furthermore, predetermined parameter values are proposed for how the strike price in the CfD and the interest rate on central government loans are adjusted when the risk- and earnings-sharing mechanism is activated. This means that the bigger the cost overrun, the longer it will take before the yield is restored to the predetermined range. Both of these elements in the memorandum's proposal aim to preserve the incentives for an efficient implementation of the project during the construction phase, regardless of whether the yield is within or outside the specified range.

The Government's view is that these principles are reasonable, but that there are also other possible designs for the risk- and earnings-sharing mechanism able to preserve the incentives for the project company, and that these should not be ruled out in advance. Inspiration can be drawn from risk-sharing mechanisms used in other countries, where yields above or below a certain level are shared between central government and the project company in predetermined proportions. Another option is that the protection offered by the yield range covers only part of the invested equity capital in the project company, which would facilitate a clearer allocation of certain risks (see more in the next section). The Government assesses that the design of the terms and conditions should be adapted to the specific circumstances in each individual project, in order to ensure an appropriate allocation of risk.

A yield that is proportionate to the risk in the investment

Some consultation bodies including *Vattenfall* and *IFN*, expressed views regarding which factors should be taken into account in the risk- and earnings-sharing mechanism in order to achieve an efficient allocation of risk. According to the assessment in the memorandum, it is challenging to identify, contractually regulate, and in practice determine responsibility for events that affect the profitability of the project. This means a risk of disputes arising between central government and the project company, which could make the project's implementation more difficult rather than more efficient. In view of these difficulties, the memorandum proposes that the yield range should encompass the entire invested equity capital in the project company, regardless of the reason behind a cost overrun.

The Government shares the assessment that it can be complex to establish a causal relationship, for example between a regulatory change and increased costs in a project. At the same time, a clearer division of responsibilities can facilitate a more efficient allocation of risk, where the party who is best placed to manage a certain risk also bears that risk. Therefore and similar to among others *IFN,* the Government makes a different assessment to that in the memorandum and considers that clearly definable risks ought to be shared between the project company and central government.

The lower limit in the risk- and earnings-sharing mechanism range means that negative outcomes – to varying degrees depending on the exact design – are transferred from the project company's owners to central government. Similarly, the upper limit means that the project company's owners waive part of the yield in successful projects. The Government argues that such a limitation on possible yield outcomes should be reflected in the expected yield on investments in the project company.

Some consultation bodies, including the *National Institute of Economic Research* and the *Swedish National Debt Office*, argue that the expected yield calculated in the main scenario in the memorandum appears to be high in relation to the risks transferred to central government. The Government shares the assessment that the memorandum's proposal provides comprehensive protection against risks during the construction phase, but considers that a quantitative assessment of what constitutes a fair, risk-adjusted yield can only be made once the specific conditions for an individual project are known.

A key principle that the Government considers should always apply is that the expected yield and the yield range should be proportionate to the risk that the investment entails, taking into account the protection provided by the risk- and earnings-sharing mechanism. Compliance with this principle is also considered to be a prerequisite for the aid to meet the proportionality requirements in the state aid rules.

Potential need for earnings sharing later in the project

The memorandum makes the assessment that the proposed model is designed to meet the requirements imposed in a state aid investigation, but that it cannot be ruled out that certain adjustments will become necessary. Based on this assessment and a more detailed analysis of previous cases of state aid for new nuclear power, further measures to avoid excess remuneration to the beneficiary will probably be needed. The approved support schemes for nuclear power projects in the UK and the Czech Republic include earnings-sharing mechanisms (claw-back) to ensure that excess remuneration to the beneficiary is prevented throughout the life of the project. The Government therefore assesses that the risk- and earnings-sharing mechanism may need to be supplemented with terms and conditions providing the option to distribute the project company's earnings between central government and the project company's owners even after the central government loans and the CfD have expired. If such a mechanism comes into question, earnings transfers between the project company and central government need to be managed in a different way

than through changes in the terms and conditions of the loans and the CfD, for example through lump sums.

Valuations to determine when risk and earnings sharing is activated and terminated

In order to determine if and when the risk- and earnings-sharing mechanism should be activated and for how long it should continue, an estimate of the yield on invested equity capital is needed. The Government shares the assessment in the memorandum that it should not be possible to activate the mechanism until some time after commercial operation has started. At this point, the capital costs and the injection of equity capital in the project company are known, which allows for a more precise assessment of the long-term expected yield than is possible during the construction phase.

The memorandum proposes that a market valuation of the project company's equity capital should be the basis for determining whether the risk- and earnings-sharing mechanism should be activated. It is proposed that the valuation is carried out by two independent valuers, and only once after the nuclear power plant has started commercial operation.

A number of the consultation bodies, including *Kärnfull Next* and *Swedenergy*, point out that an assessment of the market value of a company's shares is subject to uncertainty. The memorandum proposes that certain conditions for the valuation could be regulated in advance, but that overly detailed provisions could undermine the objective of independent assessments of market value. However, the state aid investigation requires a high degree of predictability where ex-ante assessments are consistent with those made later in the project (ex-post), and this assumes that the same financial calculation model is used over time. A market valuation carried out by an independent party without clear and consistent guidelines over the long term concerning the valuation methodology and calculation models may constitute impediments to the aid being approved by the European Commission.

In light of this, the Government assesses that the method used to determine when the risk- and earnings-sharing mechanism is activated and terminated should be established in contract and checked with the Commission early in the state aid process. If the conditions for the valuation need to be defined so clearly that the valuer cannot influence the outcome, the Government considers that this reduces the need to use external valuers.

A number of consultation bodies, including *Vattenfall*, *Uniper* and the *Confederation of Swedish Enterprise,* advocate more valuation points to reduce uncertainty for investors. The Government's view is that there may also be advantages to having multiple valuation points that can activate the risk- and earnings-sharing mechanism from central government's point of view, as this extends the period during which any surplus earnings in the project are shared between central government and the project company. In addition, more valuation points can reduce the risk that temporary circumstances at the time of an individual valuation have a disproportionate impact on the outcome.

In light of this, the Government assesses that the number of valuation points and the timing of these should be adjusted based on the specific project's conditions and established through negotiations between the project company and central government.

5.3 An Act on state aid for investments in new nuclear power is passed

The Government's proposal: A new Act is passed that regulates the fundamental conditions and procedures for state aid to companies looking to invest in new nuclear reactors in Sweden.

The memorandum's proposal accords with the Government's proposal. However, the memorandum's proposal does not explicitly state that the proposal applies in Sweden.

Consultation bodies: The *Royal Swedish Academy of Engineering Sciences (IVA)* is of the view that the memorandum presents a very brief Act that leaves it to the Government, or the authority designated by the Government, to decide to issue additional regulations, which means that established practice may change over time depending on the deliberations of future governments. IVA also points out that the financing of the CfDs requires approval from the Riksdag.

Reasons for the Government's proposal: State aid for investments in new nuclear power means that central government is involved in complex industrial projects through extensive financial commitments over a very long period of time. Support schemes are normally regulated at the Ordinance level. Ordinances are issued under the Government's residual powers pursuant to Chapter 8, Article 7, 1st paragraph, point 2 of the Instrument of Government of Sweden. However, the Government considers that the kind of extensive commitment that is now in question should have the support of the Riksdag and be regulated in an act of law pursuant to Chapter 8, Article 8 of the Instrument of Government, so that the basic conditions and procedures for aid are made clear. Just as *IVA* points out, the proposed Act does not regulate the financing of the aid as such and does not entail the Government being given expanded powers in relation to its powers under the Budget Act (2011:203). The financial power lies with the Riksdag, which will decide on funds and financial commitments through the central government budget. The Act should cover the basic conditions and procedures for aid. It provides a framework for the detailed design of the aid components, including the financing and risk-sharing model's parameters and the other terms and conditions that need to be negotiated for each project. It also provides a basis for the design of the Government's budget proposal and the Riksdag's budget decision by clarifying the essential elements required for the aid and making them predictable. If the detailed conditions for the aid are to be regulated, this should preferably be in ordinance. In addition, contracts will be concluded that are subject to the terms and conditions for the aid (see Section 5.4.2). *IVA* expresses the view that the proposed Act, whereby the Government is given the right to issue additional regulations, will mean

that established practice may change over time depending on the deliberation of future governments. As described in Section 5.4.1, a decision to grant state aid for investment in new nuclear power will involve taking policy into consideration as well as practical considerations. The need for new nuclear power and the conditions for state aid for investment in new nuclear power will determine whether and to what extent central government will grant aid under the Act. In practice, a decision to grant aid will be made on the basis of the circumstances in the individual case.

The Government considers that the Act should explicitly state that support may be granted for investment in new nuclear reactors in Sweden. This makes it clear that the aid is granted so that companies will invest in new reactors within Sweden's national borders. This does not constitute a change in relation to the Inquiry's proposal, but will now be clarified in the Law.

5.4 Prerequisites for aid

5.4.1 The Government's decision to grant aid must be preceded by an application and, as a general rule, include a minimum installed capacity

The Government's proposal: Following an application to this effect, the Government may decide to grant aid to a company for the purposes covered by the central government loans and CfDs.

Aid may only be granted if the new nuclear reactors are located in the same place in Sweden and have a total installed generator capacity of at least 300 MWe. If there are special reasons, the Government may decide to grant aid even if the reactors have a total installed generator capacity of less than 300 MWe.

The memorandum's proposal accords in part with the Government's proposal. The memorandum's proposed Act has a different wording and drafting and does not state that the minimum level in MWe applies to nuclear reactors located at the same site in Sweden. The memorandum's proposal includes a prohibition on appeals.

Consultation bodies: Most of the consultation bodies submitting comments on the design of the aid do not express an opinion on or object to the Government being permitted to decide on granting aid, nor that the decision is based on a written application, nor that the application should include a certain minimum installed generator capacity. *Svenska kraftnät*, the *Swedish Energy Agency*, the *Swedish Competition Authority, Uniper,* the *Swedish Association of Local Authorities and Regions (SALAR)* and *IFN* consider that the procedure for applying for aid should be open to competition. *Svenska kraftnät*, the *Swedish Energy Agency* and *IFN* would like to see an auction, while *Uniper* and others contend that it should be clear how the Government will prioritise between different applications received should multiple applications be submitted. *Blykalla* contends that it is important to have decentralised generation in order to compensate for high losses in the network, and that the need for local strengthening is often significantly less than 300 MWe, and therefore this restriction should be

removed. *KTH* also argues that if a new, smaller reactor were to be installed at the site of an already existing power plant that exceeds 300 MWe in installed generator capacity, this reactor too should be supported, as this would make the aid more technology-neutral and open to the next generation of reactor technology. IFN also recommends a lower limit than 300 MWe. *Chalmers* considers that it is important that decisions not to grant aid can be appealed in a court. The *National Agency for Public Procurement* contends that decisions concerning recovery of granted aid to a company should normally be subject to appeal by the company. The Agency is also of the opinion that the practical management of the support scheme should be entrusted to a government agency.

Reasons for the Government's proposal

Decision to grant aid following an application from a company

State aid for investment in new nuclear power is based on the premise that there are companies in the marketplace that, under the conditions that central government can offer, are willing to invest in new nuclear reactors in Sweden. It is voluntary for companies that plan to invest in new reactors to do so with aid from central government. A company that wishes to receive aid should therefore apply to the Government for aid. Therefore the Government's view, in accord with memorandum's proposed Act, is that a decision on aid should follow an application from a company.

The Government should decide on aid

As proposed in the memorandum, the Government considers that decisions on state aid for investment in new nuclear power are best made by the Government. The reasons for this are many.

The question of the construction of new nuclear reactors in Sweden involves policy considerations in several key areas of national government including energy policy, industry policy, and environmental and climate policy. Industrial projects of this size and with such a long-term perspective also have clear foreign and security policy dimensions. The foreign and security policy aspects become particularly important in a deteriorating global situation. The Government is responsible for coordinating policy in all the areas affected by a decision that concerns the construction of new nuclear power. No other body than the Government could achieve a comprehensive examination of the matter that could strike the necessary balance between different interests. It is also important that a decision of such importance as the construction of new nuclear reactors be made by a body that is politically accountable. In addition, according to the examination scheme in the Nuclear Activities Act and the Swedish Environmental Code, the Government has a central role in decision-making concerning the construction of new nuclear reactors in Sweden.

In the preparation of a case within the scope of the new Act, the Government can also make use of the administrative authorities and their specialist expertise in various areas to obtain a comprehensive analysis of the issues and interests involved in a decision concerning new nuclear reactors. Furthermore, state aid for investment in new reactors is deemed to be a prerequisite for the construction of new nuclear reactors in Sweden

(see Section 4.2 above). Such aid entails large financial commitments for central government over a long period of time with significant effects on public finances. Therefore, in accord with the memorandum and in contrast to the *National Agency for Public Procurement*, the Government's view is that it should be the Government and not a government agency under the Government that should make decisions on aid under the proposed new Act.

The Government's decision on aid should rest on a discretionary provision

Unlike others including *Svenska kraftnät*, the *Swedish Energy Agency* and the *Swedish Competition Authority,* the Government does not see an auction or tendering procedure as appropriate. As mentioned above, a decision to grant state aid for investment in new nuclear power involves taking policy into consideration as well as practical considerations. The Government must therefore be able to decide when and to whom and under what conditions there are grounds for granting state aid. In practice, a decision to grant aid will be made on the basis of the circumstances in the individual case. Among other considerations, the intention behind the Government being the decision-making authority is thus that policy assessments should be able to overturn the outcome of an application for aid, since the issue of aid constitutes an important issue of general importance. Furthermore, an auction or tendering procedure would need to lock in certain parameter values for the model in advance. As the Swedish Energy Agency points out, this would make it difficult to adapt the aid to the needs of the moment and to the terms and conditions that central government can agree on in negotiations with the company applying for the aid. Sweden's need for new nuclear reactors as well as the need and basis for central government to grant aid for the establishment of new reactors in the country may vary over time. In conclusion, the Government considers it important that the provision regulating the Government's powers to decide on aid is discretionary and leaves scope for the Government to consider the project from all angles. The companies that apply for aid must not therefore be granted any kind of right to aid.

The Government's decision to not grant aid cannot be appealed

Chalmers is of the view that a decision not to grant aid should be subject to appeal in a court. The Government does not share this view. A decision to grant aid does not concern a civil right under Article 6.1 of the European Convention for the Protection of Human Rights and Fundamental Freedoms (the European Convention).

Applications for aid are examined and decided on a case-by-case basis taking into account many different circumstances and policy considerations. The provisions in the proposed Act give the Government a discretionary right to decide whether and when it considers that aid should be granted to a company, provided that certain fundamental conditions are met. This, along with the fact that the terms and conditions and design of the aid in detail are negotiated and agreed in private law contracts between central government and the project company invalidates the possibility of a decision on aid being subject to judicial review. The

Government thus shares the assessment in the memorandum that a decision on aid should not be subject to appeal but unlike the memorandum's proposal, does not consider that an explicit prohibition of appeals should be introduced into the Act. There is no general right to appeal against decisions made by the Government. The general provisions concerning appeals in the Swedish Administrative Procedure Act (2017:900) are not applicable to the Government's decisions, as the Government is not an administrative authority. Government decisions can only be subject to judicial review to the limited extent set out in the Act on Judicial Review of Certain Government Decisions (2006:304). This presupposes that the decision relates to an examination of the individual's civil rights or obligations within the meaning of Article 6.1 of the European Convention, which, according to the Government, is not considered to be the case here for the reasons outlined above.

The opinion of the *National Agency for Public Procurement* is that a decision on recovery of aid paid should be subject to appeal in a court because such decisions can normally be appealed. The proposed Act states that the aid that the Government decides to grant to a company must be subject to terms and conditions governed by private law contracts between central government and the company. The terms and conditions that the company must satisfy, as well as the circumstances constituting a breach of contract which would make it possible for central government to demand repayment of the aid, will be regulated in the contracts. As argued in Section 5.1, the contracts must contain terms and conditions that take into account central government's risk, central government's ability to assert its rights, and central government's needs for control and follow-up. This means, according to the Government, that the contracts must also include provisions concerning the repayment of aid if the conditions for granting the aid are no longer being met. There is therefore no reason to regulate the question of appealing an order for recovery in the Act in the manner proposed by the National Agency for Public Procurement.

A decision to grant aid should include a minimum total installed generator capacity

The Government's processing of an application for aid for investment in new nuclear power will be resource-intensive. Detailed contracts with all relevant terms and conditions for the aid need to be negotiated between central government and the project company. Furthermore, the aid granted for each project needs to undergo a state aid investigation by the European Commission, which may require revision and renegotiation before the contracts can be signed. Investment in new nuclear power is an important tool in the implementation of a fossil-free energy system and to ensure a robust and reliable electricity supply. To justify being granted state aid, the project should be making a significant contribution in this regard, and therefore the investment in new nuclear power to which the aid relates must be of a certain minimum project size. The figure of 300 MWe coincides with the limit value that Svenska kraftnät has for connection to the 400 kV transmission network. The proposed minimum installed generator capacity does not either rule out the inclusion of SMRs in a project, as long as the total installed generator capacity of these reactors

amounts to at least 300 MWe in one and the same location. Based on this, the Government, unlike *Blykalla*, *KTH* and *IFN*, considers that the minimum limit proposed in the memorandum of 300 MWe of total installed generator capacity is well-balanced and should constitute the general rule. But it is also difficult to foresee all the circumstances that may arise, and in what instances the minimum limit may prove to be an unwanted obstacle. The Government should therefore be able to make exceptions if there are special reasons for doing so. Such reasons might be that even though a project does not amount to 300 MWe, it is nevertheless considered to have the potential to make a significant contribution to the energy system being able to meet the needs set out in Section 4.1. At the same time, the justifications set out in Section 4.2 for the introduction of this state aid should be assessed as applicable to the project in question, i.e. that the aid is necessary for the project to get off the ground despite design risks, market risks, and policy and regulatory risks.

In light of this, the Government's view is that aid should be granted to projects involving the construction and operation by a company of a new nuclear reactor with an installed generator capacity of at least 300 MWe. Where the project refers to several new nuclear reactors, they must be located in one and the same geographical location in the country and have a total installed generator capacity of at least 300 MWe. If there are special reasons, the Government may decide to grant aid even if the reactors have a total installed generator capacity of less than 300 MWe. State aid for investment in new nuclear power aims to enable new nuclear reactors in Sweden. Therefore, there should be an explicit requirement that the geographical location should be in Sweden. Investment in existing nuclear reactors should not be covered by the aid.

5.4.2 Aid may only be granted when central government and the beneficiary company enter into contracts regulating the terms and conditions of the aid

The Government's proposal: Aid may only be granted when central government and the beneficiary company enter into contracts regulating the terms and conditions of the aid.

The memorandum does not contain any corresponding legislative proposal, but it is clear from the other proposals in the memorandum that the intention is that contracts should be concluded between central government and the project company.

Consultation bodies: No consultation body expressed an opinion specifically on this part.

Reasons for the Government's proposal: The detailed design of the state aid and its conditions, as described above and as also stated in the memorandum, will be determined after negotiations between central government and the project company and will be governed by private law contracts between the parties. However, a decision to grant aid should not be made by the Government until the terms and conditions of the aid are negotiated and the contracts are in principle ready for signature. This is important because the conditions governing central government's

commitments in connection with the aid should be clear before the Government decides to grant aid to large-scale projects for investment in new nuclear power. For example, a government decision on aid can be made in close connection with the contracts being signed. Practical considerations may determine when the contracts are to be signed in relation to the Government's decision to grant aid. What is important is that the Government does not decide in advance to grant aid until the terms and conditions for the aid have been negotiated and are clear between central government and the project company.

5.4.3 Aid is granted to a project company

The Government's proposal: Aid may only be granted to a company whose exclusive or virtually exclusive purpose is the construction, possession and operation of the new nuclear reactor or reactors to which the aid decision relates.

The memorandum's proposal accords with the Government's proposal. The proposal in the memorandum has a different linguistic and editorial design.

Consultation bodies: The *National Agency for Public Procurement* contends that the model proposed with separate companies for each beneficiary project company is well-considered for the purposes of control and monitoring of the system.

Kärnfull Next contends that, due to this company pursuing project development for SMRs, that an application might involve a number of reactors at the same site, in which case the design phase can last for a long time but the units are successively commissioned. Kärnfull Next therefore proposes that a nuclear power plant has an overarching project company that is responsible for joint company and plant costs, and because each of the reactors operates under its own project company, these are then subsidiaries of the overarching project company. The *Swedish Energy Agency* sees the requirement regarding separation from the owner companies as potentially problematic, as these companies possess all the skills and financial resources, and because there is a risk that the project company can be declared bankrupt without any major consequences for the owner company.

Reasons for the Government's proposal: The Government's view, which is in accord with the memorandum, is that it should not be possible to grant aid to companies that are pursuing activities other than those provoked by the investment in new nuclear power. It is therefore important that aid may only be granted to a company whose exclusive or virtually exclusive purpose is the construction, possession and operation of the new nuclear reactor or reactors. The reasons for this are several. Firstly to enable central government to more easily monitor the costs that arise and to ensure that the funds are not used for purposes other than those intended, which even the *National Agency for Public Procurement* sees as central. Secondly, the activation of the risk-sharing mechanism requires that the activity to which the aid relates operates in a separate company. Thirdly, it means that the project company can have multiple owners who share the

risk of the investment. An additional reason is that the investment in new nuclear power is clearly separated from the owner company's or companies' other activities, which increases transparency and facilitates ratings and analyses by credit rating agencies and other external actors and financiers. For these reasons, the Government considers that the model proposed by *Kärnfull Next* with an overarching project company responsible for the joint costs of individual reactor companies is not suitable. The project company receiving the aid is the same company that applies for a licence under the Nuclear Activities Act. The granting of such a licence requires the company to be able to demonstrate that it has the requisite skills and resources. Furthermore, the capital investments in the company are deemed to be so large that bankruptcy would have tangible consequences for the owner. The Government therefore considers that the advantages of a separate and clearly defined project company as the aid beneficiary outweigh the possible disadvantages that the *Swedish Energy Agency* highlights. The proposed Act entails a general rule whereby aid can only be granted when the investment covers reactors with a total installed generator capacity of at least 300 MWe, and where the reactors are located in the same place. In other words, these conditions must be met, and must lie within one and the same project company in order for aid to be granted.

The purpose of the project company must thus be the construction, possession and operation of the new nuclear reactor or reactors to which the aid relates. However, this does not preclude the project company from pursuing related activities which, in the normal course of business for the construction, possession and operation of new nuclear reactors, are necessary to be able to carry out the project to which the aid relates. For example, the company may need to import and handle nuclear fuel, carry out civil engineering works at the site where the reactor is to be built, or logistics and similar activities required for a project of the scope currently in question to become a reality.

5.4.4 The project company must have applied for a licence under the Nuclear Activities Act and the Swedish Environmental Code before support may be granted

The Government's proposal: Aid may be granted only after the beneficiary company has applied for the licences required under the Nuclear Activities Act and the Swedish Environmental Code for the construction, possession and operation of the new nuclear reactor or the new nuclear reactors to which the decision to grant aid relates.

The memorandum's proposal does not accord with the Government's proposal. The memorandum's proposal means that, at the time when the decision to grant aid is made, the activity must be covered by a licence under the Nuclear Activities Act and be permitted under Chapter 17 of the Swedish Environmental Code.

Consultation bodies: *Fortum, Kärnfull Next, Uniper* and *Vattenfall* are all of the opinion that it should be possible to receive aid before the

necessary licences under the Nuclear Activities Act and the Swedish Environmental Code have been obtained, among other things, to enable an efficient investment process and give the necessary credibility to the project. The *Swedish Radiation Safety Authority* contends that the requirement for an applicant to hold the named licences means that an operator cannot utilise state aid to demonstrate sufficient financial resources for the licence application process under the Nuclear Activities Act. The *Swedish Energy Agency* contends that the various processes involved in the licence application process, negotiations on aid between the Government and the project company, and the state aid investigation can lead to a time-consuming Catch-22 situation, in part because the various processes must be completed at the same time and are based on advance rulings from the other bodies.

Reasons for the Government's proposal: The process of being granted the necessary licences to construct, possess and operate nuclear power plants is extensive, costly and takes a long time. It involves multiple government agencies and courts and involves different regulatory frameworks. A summary outline of the procedure can be found in Section 7.3.4 of the memorandum. It can take several years before a company applying for the necessary licences under the Nuclear Activities Act and the Swedish Environmental Code to be granted a licence to construct, possess and operate a new nuclear reactor.

The purpose of state aid for financing new nuclear power is to stimulate the construction of new nuclear reactors in Sweden. The conditions for being able to apply for state aid therefore need to be designed in such a way as to make it easier for companies to invest in the establishment of new reactors. The Government shares the *Swedish Energy Agency's* view that if all processes must be parallel and are dependent on each other, it could lead to complications. Furthermore, a requirement that a company must obtain the necessary licences before the Government decides whether the investment should be granted state aid means that the company needs to invest large amounts and expend extensive resources on the project without having any certainty about its financial basis. The Government understands that this is not seen as creating the kinds of conditions that a company needs to invest in such a large and capital-intensive project as an expansion of nuclear power. At the same time, companies interested in applying for state aid for investment in new nuclear power must be induced to take the steps needed to make the envisaged investment a reality. The Government also needs assurance that the extensive process for the Government that an application for aid entails is grounded in the willingness and capacity of a serious actor to invest in and operate new nuclear reactors. The Government therefore proposes that aid may be granted only after the project company has applied for the licences required under the Nuclear Activities Act and the Swedish Environmental Code for the construction, possession and operation of the new nuclear reactor or the new nuclear reactors to which the decision to grant aid relates. This proposal also addresses the information provided by *Swedish Radiation Safety Authority's* that a requirement for a licence before a decision on aid is not compatible with the requirement under the Nuclear Activities Act that the company is able to demonstrate sufficient financial resources during the licence application process. The requirement to have

applied for the required licences does not mean that the aid will be granted as soon as such applications have been submitted and the state aid investigation is complete. The Government may need to wait for a period of time in order to form an opinion on the quality of the licence applications.

Fortum and *Uniper* point out that the regulatory framework for the licence application process is changing, and that this should be taken into account when designing the Government's proposal. The Government has received the report *Ny kärnkraft i Sverige –effektivare tillståndsprövning och ändamålsenliga avgifter* (SOU 2025:07) (New nuclear power in Sweden – more efficient licensing processes and appropriate fees). The report is being prepared in the Government Offices of Sweden. The Government considers that the Act on state aid for investments in new nuclear power should enter into force as soon as possible and therefore cannot await this preparation. The proposed Act on state aid for investments in new nuclear power has therefore been drafted on the basis of the current rules governing the licence application process.

5.4.5 Requirements imposed on the project company's owners and management

The Government's proposal: Aid may only be granted to a company if persons who have a qualifying holding in the company are suitable to exert a significant influence over the management of the company, and persons who are part of the company's management are suitable for such a task..

Qualifying holding means here the same as in Chapter 1, Section 5, point 15 of the Banking and Finance Business Act.

The memorandum's proposal largely accords with the Government's proposal. The memorandum's proposal has a different wording, meaning that the examination of the company's owners and management is based on somewhat different criteria.

Consultation bodies: No consultation body expressed an opinion specifically on this part.

Reasons for the Government's proposal: It is of the utmost importance that aid is only granted to project companies whose major shareholders and representatives are deemed suitable. The probity check aims to prevent an unsuitable owner from being able to abuse their position of power and influence over the company, and to ensure that the immediate management of the company consists of persons deemed suitable for such a task.

The probity check should cover all owners who have a qualifying holding in the company and persons who are members of the company's management. Where an owner is a legal person, the probity check is to cover representatives of the legal person. Management refers here to the directors on the Board of Directors and their alternates, the Managing Director or CEO and the Deputy CEO.

The probity check should check the suitability of the owners to exert a significant influence over the management of the company. This means,

among other things, that the owner or owners must be assessed to be honest and upright persons of integrity, and possess what is required to, for example, apply for and utilise a granted licence to construct and pursue the project to completion. This probity check should take into account the size of each holding and the influence exerted.

Concerning the management of the project company, the probity check should ensure that the individuals who hold management positions are deemed suitable to hold these roles. This means, among other things, that they must be deemed to be honest and upright persons of integrity, and possess experience that is relevant to the task.

In assessing the suitability of the owners and the management, particular attention should be paid to whether they have failed to fulfil their obligations in their business activities or other financial affairs to a significant degree, or committed a serious offence. Examples of this include that they have been convicted of tax offences, economic crime, or crime targeting Sweden's national security, or have been subject to bankruptcy proceedings (cf. Govt Bill 2008/09:155 p. 87).

The probity check should be part of the examination of an application before a decision is made to grant state aid. To be able to verify the aforementioned circumstances regarding the project company's owners and management, the Government needs to obtain the necessary documentation for the probity check. In the Ordinance that it intends to draft, the Government can specify the information in detail needed for the probity check. Changes in ownership and management circumstances in a project company should also be monitored through, for example, terms and conditions in the aid contracts.

5.4.6 The aid must be compatible with EU state aid rules

The Government's assessment: The Articles in the Treaty on the Functioning of the European Union which establish that support schemes may not be implemented until the European Commission has made a decision to approve the scheme are directly applicable, and do not need to be detailed in a separate provision in the proposed Act.

The memorandum's proposal does not accord with the Government's assessment. The memorandum proposes an information provision in the Act.

Consultation bodies: No consultation body expressed an opinion specifically on this part.

Reasons for the Government's assessment: The Government shares the assessment in the memorandum that aid provided under the proposed Act is subject to the state aid rules set out in Articles 107–109 of the Treaty on the Functioning of the European Union. Under Article 108, a Member State must inform the European Commission of any plans to grant or alter aid. Where no particular exception is applicable, the Member State must not put its proposed measures into effect until the Commission has approved the measures. The Government intends to inform the Commission of the state aid which the Government intends to provide to a project company in each separate case and await the Commission's approval before deciding to grant aid. A summary outline of the process can be found in Section 7.2. In this context, the Government considers that there is no need for any information provision concerning this in the Act.

5.5 The Government may issue additional regulations governing the aid

The Government's proposal: Notification that the Government, pursuant to Chapter 8, Section 7 of the Instrument of Government, may issue additional regulations governing the aid.

The memorandum's proposal accords in part with the Government's proposal. The memorandum proposes that it is the Government, or the authority designated by the Government, that may issue additional regulations governing what the application must contain.

Consultation bodies: No consultation body has expressed an opinion specifically on this part.

Reasons for the Government's proposal: Exercising its residual powers pursuant to Chapter 8, Article 7, 1st paragraph, point 2 of the Instrument of Government, the Government may issue regulations governing state aid to companies for investment in new nuclear power. However, the proposed Act means that it would be the Riksdag that regulates the basic conditions and forms of the aid in accordance with Chapter 8, Article 8 of the Instrument of Government. The Government considers that the power to adopt additional regulations governing the aid

should remain with the Government so that, for example, the detailed terms and conditions for the aid, and the requirements for what an application for aid should contain, can be regulated in ordinance. It should therefore be notified that the Government may issue additional regulations governing the aid.

The Government also has the power under Chapter 8, Article 7, 1st paragraph, point 1 of the Instrument of Government to adopt provisions relating to the implementation of laws. However, there is no need for an information provision concerning this.

5.6 Entry into force and transitional provisions

The Government's proposal: The new Act on State aid for investments in new nuclear power will enter into force on 1 August 2025.

The Government's assessment: There is no need for transitional arrangements.

The memorandum's proposal does not accord with the Government's proposal. The memorandum's proposal means that the Act will enter into force on 6 May 2025.

Consultation bodies: Several consultation bodies would like to see socio-economic analyses and further impact assessments before an aid scheme is introduced, among them the *Swedish Energy Markets Inspectorate* and *Företagarna.* On these grounds, these consultation bodies oppose an implementation. Furthermore, *IVA* questions that the Act will enter into force as early as 6 May 2025 in light of inadequate sensitivity and impact assessments.

The *Confederation of Swedish Enterprise* stresses the importance of achieving momentum for investment in new nuclear power as a consequence of a global race for resources for such an expansion.

Reasons for the Government's proposal: The proposed Act would not mean that central government is bound to provide aid to investment in new nuclear power. However, the Act enables the initiation of the processes required for a decision to grant aid for the construction of new nuclear power. The process prior to a decision to grant aid involves multiple time-consuming steps, including an application to the European Commission for approval of the state aid and negotiations between the Government and a project company. At the same time, stakeholders may need some time to set up a project company and prepare an application under the new Act, for example. Added to this are the extensive licence application processes required to build new nuclear reactors, in which financial conditions are an important part. In addition to the time aspects, there will also be global competition for the resources required for an expansion of nuclear power, which is what the *Confederation of Swedish Enterprise* contends. In Section 8, the Government provides an impact assessment of decisions to grant aid within the framework of the Act and considers that this impact assessment provides a sufficient basis for the Act to enter into force. In contrast to others including the *Swedish Energy Markets Inspectorate*, the Government does not consider that further impact assessments are

necessary. The Government assesses that new nuclear power is needed and that this requires state aid at least for the initial projects, as described in Section 4. It is therefore important that the Act can enter into force as soon as possible. In view of this, and taking into account the remaining preparatory measures and the Riksdag's processing time, the new Act should enter into force on 1 August 2025. No transitional arrangements are deemed necessary.

5.7 The aid should cover a certain amount of installed generator capacity

The Government's assessment: Aid for investment in new nuclear reactors should include investment in new nuclear power corresponding to an installed generator capacity of up to approximately 5 000 MWe.

The memorandum's proposal largely accords with the Government's assessment. The memorandum sets out a range of 4 000–6 000 MWe.

Consultation bodies: Several consultation bodies including *SKGS, Technology Industries of Sweden* and the *Confederation of Swedish Enterprise,* are of the opinion that the scope of the aid must be large enough to realise economies of scale but at the same time sufficiently limited to keep costs and the risk for taxpayers and electricity consumers at a reasonable level. *Swedenergy, SKGS* and the *Swedish Forest Industries Federation* estimate that 4 000–6 000 MWe, corresponding to 10–15% of the expected total production in 2045, is a reasonable scope. *If Metall* shares the view that investment equivalent to approximately 5 000 MWe is necessary to ensure that investments in a new repository for nuclear waste do not become too burdensome for the new projects. *Vattenfall* estimates that if the cost of a new repository programme is to be reasonable, the expansion needs to amount to at least 4 000 MWe, and that a guarantee is needed that the first project will only be charged its share. *Uniper* also argues that guarantees should be issued for the handling of waste from a new reactor in the future in order to reduce the risk for the company that builds the first reactor.

The *Swedish Energy Markets Inspectorate* considers that positive learning effects cannot be taken for granted because it is unclear whether the same type of nuclear reactor will be built. The *Swedish Energy Agency* argues that a lower limit of 300 MWe for a project in combination with the programme size being large risks leading to a number of heterogeneous small projects, which could run counter to achieving economies of scale and learning effects, and raises the question of whether a step-by-step procedure with a first step of 2 500 MWe would be preferable. *Svenska kraftnät* holds the view that the model should be designed to be more flexible and capable of handling scenarios that deviate from the Government's planning target of 300 TWh.

Reasons for the Government's assessment

In its Energy Policy Framework Bill, the Government has presented its assessment that new nuclear power with a total installed generator capacity

of at least 2 500 MWe, equivalent to two large-scale reactors, should be in place by 2035, and that a strong expansion is needed by 2045 (Govt Bill 2023/24:105 p. 36). The Inquiry on financing and risk-sharing was tasked with developing a risk-sharing model that would help to get 2 500 MWe in place in 2035. In the memorandum, the assessment is that 2 500 MWe is not sufficient to realise the economies of scale necessary for investments in the individual projects to be profitable. For this reason, it is proposed that the financing and risk-sharing model should cover investment in new nuclear power corresponding to installed generator capacity of 4 000–6 000 MWe.

The Government, in accord with *Vattenfall, Uniper* and *IF Metall,* shares the memorandum's assessment that 2 500 MWe is unlikely to be sufficient to manage the programme risk. Investments in a repository for nuclear waste are subject to high fixed costs. If these fixed costs are distributed across a volume of electricity generated from nuclear reactors that is too low, there is a risk that individual projects will be unprofitable. Increasing the scope of the aid can created the conditions needed for multiple projects in the future to share the fixed costs for the disposal of nuclear waste, similar to how the nuclear waste programme for existing nuclear reactor owners works.

For the actor or actors who build the first reactors, there is uncertainty about whether a more extensive expansion of nuclear power will materialise. The Government has therefore tasked the National Debt Office with investigating and proposing how the programme risk can be reduced so as not to adversely affect willingness to invest in the first projects (KN2024/01812). The intention is to address this risk outside the financing and risk-sharing model, although the conditions for risk sharing when it comes to the repository question are likely to be taken into account by the European Commission in a future state aid investigation of a project.

In addition to the cost of disposal in a repository, there may be other economies of scale with an expansion of more than 2 500 MWe. The *Swedish Energy Markets Inspectorate* considers that positive learning effects cannot be taken for granted. The Government argues that it is likely that the first reactors built in Sweden will be more expensive than their successors, and thus shares the assessment in the memorandum. As experience is built up and new logistics chains are established, both the costs and risks of building new nuclear reactors are expected to decline, and thus the need for state aid will also change.

This aid is intended to be a means of kick-starting investment and the establishment of new nuclear power in Sweden. Therefore, and in accord with *SKGS*, *Technology Industries of Sweden* and the *Confederation of Swedish Enterprise*, the Government assesses that a limit should be specified. *Swedenergy*, *SKGS* and the *Swedish Forest Industries Federation* estimate that 4 000–6 000 MWe is a reasonable scope. The Government considers that the limit should be in the form of a maximum level and an appropriate level should be the midpoint of the range specified in the memorandum. As there may be a need for some scope for flexibility around this maximum level, depending on the choice of reactor models, it is given in approximate terms. The Government therefore considers that

the aid should cover investments in new nuclear power corresponding to an installed generator capacity of up to about 5 000 MWe.

The *Swedish Energy Agency* argues that there are reasons to consider a step-by-step procedure. The Government shares this view and argues that the proposed procedure, which entails a project-specific application, examination of the application, and a decision to grant aid or not, means a gradual requisitioning of the aid, where both the need for new nuclear power and the need for aid can be taken into account.

6 State ownership in project companies

The Government's assessment: There may be reasons for the state to become a partner in a project company through the acquisition of shares. Where the state becomes a partner, it should be on terms comparable to those of the other owners. The state's holding should not be so great that it eliminates incentives for the efficient implementation of the project by the other owners.

The memorandum does not contain any proposal concerning state ownership, but argues that the proposed aid model does not either rule out the possibility of the state investing capital in exchange for shares in the project company via a state-owned venture capital enterprise, and functioning as an active owner for a shorter or longer period.

Consultation bodies: *Vattenfall* contends that the size of the project that the company is planning for is too large for Vattenfall to be solely responsible for it, and therefore welcomes the memorandum being open to state ownership in a project company with multiple partners because the state has the strongest balance sheet. *Fortum* argues that the ownership conditions for the project company need to be clarified, especially in terms of the extent to which the project company is consolidated in the owner companies' accounts. The *Chamber of Commerce and Industry of Southern Sweden* recommends a scheme where the state is a co-owner of the nuclear power plants and shares the risks that exist in the construction phase directly. The *National Institute of Economic Research* argues that an inquiry should be conducted into whether it would be preferable for central government to implement the project itself. *LO* considers that if new nuclear power is to be built with extensive public subsidies, it should be publicly owned. *IF Metall* argues that more substantial public ownership should be considered in order for taxpayers to benefit from future yields. The *Swedish Energy Agency* raises the question of whether the state should go in as a majority shareholder for the first 2 500 MW of nuclear power to reduce the costs of bearing the risks.

Reasons for the Government's assessment: There may be reasons in favour of the state going in as an owner of a project company that invests in new nuclear power. One such reason may be to create an ownership structure that, as a result of the state going in as a part owner, improves the conditions for larger nuclear power projects *Fortum* and *Vattenfall* argue that the issue of whether the project company must be consolidated in the owner companies' accounts is crucial to their being able to invest in a larger project. Consolidation means that key financial ratios in the financial reporting of the owner companies can be negatively affected by the central government loans in the project company, which risks impairing the owner companies' ability to finance themselves in the market. The risk of such effects is reduced with multiple partners in the project, where the state could be one. Even a situation with multiple owners where the project company is not fully consolidated in any of the owner companies' accounts can potentially be problematic. Credit rating agencies may assess the future commitment of the owners of the project company as meaning that a larger or financially stronger partner is

effectively expected to assume a liability that is disproportionately large in relation to its holding. Such problems ought to be reduced if the state were to be a partner in the project company.

Uncertainty about assessments that credit rating agencies and financiers might make in the future may lead to investments in projects that are smaller than is desirable from a socio-economic perspective or the complete absence of investments. Larger projects can have significant advantages. One such advantage is economies of scale, which are expected to lead to a lower LCOE for electricity. Another is that central government has certain fixed costs linked to the individual projects, such as costs for state aid investigations, monitoring and negotiations. If these costs can be distributed across a larger volume of electricity generated, this provides the basis for more efficient resource utilisation. In addition, larger projects may mean that more nuclear power generation will be in place earlier. The Government therefore considers that state ownership of larger projects may be justified. The Government also shares *IF Metall's* view that acquiring shares to be able to share in the potential yield that the project can generate may be justified.

The Government should consider whether the state owning a share of the project company that invests in new nuclear power is justified in the individual case. State ownership is not an aid component under the proposed Act on state aid for investments in new nuclear power, but assumes ownership on terms comparable to those of the other owners. The conditions for the project and the other owners' interests in jointly owning the project company with the state may result in different assessments of whether the state should acquire shares in the company and on what terms for different projects. The different conditions of the projects may also result in different assessments of what is an appropriate and efficient ownership structure in each project company and what the state's holding should be. *LO* advocates a solution where the project is state-led, which the organisation believes would supersede the need for the earnings-sharing mechanism. The *National Institute of Economic Research* considers that certain problems, such as lack of incentives in the project company to have regard to the socio-economic perspective, could be avoided if central government implements the project under its own management and that such a solution should be investigated further. The Government argues that it is important that companies that have the skills necessary to bring about new nuclear power have holdings in the project company.

Where the state goes in as a partner, the starting point is that the project company operates on a commercial basis and, like other companies with state ownership, is subject to the same laws as privately owned companies, including the Swedish Companies Act (2005:551). The Swedish Companies Act (2005:551) provides for a division of responsibilities between the owners, board and management. The enterprise's board and its management are responsible for the enterprise's organisation and for managing its affairs, as well as the day-to-day management of its operations.

The Government assesses that the state's holding should not be so large that it eliminates incentives for the other owners to carry out the project efficiently and to achieve the best possible financial return in the project

company. This does not prevent the state from becoming the majority shareholder in a project company if there are reasons for this. For the Government to be able to acquire shares in a project company, the Riksdag's approval is required pursuant to Chapter 8, Section 3 of the Budget Act. The Government therefore intends to return to the Riksdag on the matter if it is deemed to be relevant. Furthermore, state aid approval is likely to be required for any state ownership of a project company that will receive aid under the proposed Act, as there are many indications that the European Commission's investigation will cover the state's involvement in its entirety in each project.

7 The state aid process

In order for the Government to decide to grant aid to a project company, a number of other decisions need to be made. Firstly, the projects that could be the object of aid need to be selected. This is done through an open application procedure where the Government has the opportunity to compare and consider different projects that may be relevant. In addition, the European Commission's decision to approve state aid for the individual project, and the Riksdag's decision to grant the financial powers necessary for the aid, are also needed.

Section 7.1 describes the process up until the Government's decision to grant aid can be made. Section 7.2 provides a detailed account of the process of obtaining state aid approval from the European Commission.

7.1 The application process

The process for state aid is initiated by the project company submitting an application to the Government. It is intended that the provisions governing, inter alia, the content of such an application will be issued in ordinance. At the very least, an application needs to contain a project plan, which includes the site, the scope of the project, the construction schedule and costs. After an application has been received, an assessment is made of whether the project is suitable to go further in the process. For this assessment, additional information from the project company may need to be requested and information collected from relevant authorities.

The *Swedish Energy Agency,* the *Swedish Competition Authority, Svenska kraftnät* and *Skelleftea kraft* and others are of the opinion that applications for aid should be subject to competition, for example with regard to the strike price in the CfD. The Government assesses that there will be opportunities for competition between applicant companies by making the application process open to all companies that have an interest in the aid, and that it will be possible for compare the conditions for different projects. The Government assesses that when considering which projects are to be supported, it needs to be done in the form of an overall assessment of a series of societal interests and project-specific circumstances, and that it is neither appropriate nor possible to establish and rank these in advance. A tendering procedure to determine, for example, strike prices is therefore deemed not feasible.

In the event that a project is deemed appropriate to proceed, a negotiation on the scope and conditions of the aid is initiated between the Government and the project company, along with a dialogue with the Commission to facilitate the next step in the process.

Once the Government and the project company are in agreement, the Government formally notifies the aid to the Commission for investigation. During this phase of the process, the Commission may return to the Government with comments on the scope and design of the aid. These need to be acceptable from the perspective of both central government and the project company in order for the process to continue.

Once the Commission has approved the state aid, the Government can decide to grant the aid and conclude the contracts that regulate the aid in detail within the framework of the authorisations obtained from the Riksdag. This presupposes that the project company has applied for a licence under the Nuclear Activities Act and the Swedish Environmental Code, in accordance with the proposed Act in this Bill. The Government may also, where appropriate, decide to acquire shares in the project company following a separate process for this having been completed.

7.2 The state aid process

The notification process for state aid

An account of the relevant state aid provisions is provided in Section 7.2 of the memorandum. The Government assesses that the proposed aid is regarded as state aid under EU state aid rules. Furthermore, state aid approval is likely to be required for any state ownership of a project company that will receive aid under the proposed Act, as there are many indications that the European Commission's investigation will cover the state's involvement in its entirety in each project. Under Article 108 of the TFEU, a Member State must inform the European Commission of any plans to grant aid and normally must not put its proposed measures into effect until the Commission has approved the measures. The Commission approves either individual aid to identified companies or entire support (aid) schemes, allowing the Member State to approve aid to multiple companies and projects. The Government assesses that there is no basis for obtaining the Commission's approval for a support scheme for nuclear power, as an investigation for such a scheme does not give the Commission the same opportunity to take into account the details in the aid and the conditions and impact of the specific project on competition. Each instance of aid that the Government intends to grant to a project company and the detailed terms and conditions for that aid will instead be notified individually to the Commission.

Process for state aid notification and decision

The notification to the Commission concerning the state support for a project is prepared by the Government and should include a draft of the legal basis for the aid. In this case, the legal basis is assumed to be the private law contract that the Government and a project company have negotiated. The process for the Commission's processing of a state aid

notification is set out in Article 4 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union. The Commission must make a decision within two months of a complete notification having been submitted. The notification is considered complete only when the Commission does not request any further information. It is therefore appropriate that the Commission's Directorate-General (DG) for Competition should be kept regularly informed and given the opportunity to comment on the design even during negotiations between the Government and a project company. This reduces the need for further information and supplementary information being provided to the Commission after the notification has been submitted.

Once the notification is complete, the Commission will first carry out a preliminary examination of the aid in order to ascertain whether the aid is compatible with the internal market or not. In case of doubt, the Commission may decide to initiate the formal investigation procedure. The formal investigation procedure has been used in all cases where the Commission has investigated aid for new nuclear power plants in recent years. It is therefore reasonable to assume that a formal investigation procedure will also be initiated in the case of Sweden's aid for new nuclear power.

A formal investigation procedure involves the Commission publishing its preliminary assessment with a description of relevant issues of substance and law. Member States and other interested parties may then submit comments which Sweden is given an opportunity to respond to. The time to submit comments must normally not exceed one month. Taking into account the comments received, the Commission may then make a final decision. The Commission's decision can be appealed to the Court of Justice of the European Union. The Government can decide to grant aid after the Commission's approval even if the Commission's decision is appealed.

8 Consequences

The proposed new Act means that there will be a basis for initiating processes concerning the aid. However, the proposed Act itself has no direct consequences for the electricity system, economic activity, households or public finances. The Act provides a framework for state aid for investments in new nuclear reactors, which is provided in the form of loans and two-way CfDs. The Act is supplemented by assessments that are intended to form the basis of the terms and conditions to be regulated in contract between central government and the beneficiary company. The parameters that need to be determined in the contracts, such as the proportion of loans (debt capital) and the strike price, are not locked in beforehand but need to be negotiated between central government and the project company, and also undergo a state aid investigation. In addition, the Government's decision to grant aid requires that it has obtained the necessary financial powers from the Riksdag in a budget bill. Within the

law and with all the conditions for a decision to grant aid in place, this state aid will have consequences. This section is based on a series of assumptions that are used here to illustrate the potential consequences.

8.1 General assumptions for the impact assessment

New nuclear power with state aid

The starting point for the impact assessment is that investments in new nuclear power corresponding to 5 000 MWe materialise through the financing and risk-sharing model. With a capacity factor of 0.89, this corresponds to additional electricity generation of 39 TWh per year. All prices in the impact assessment are listed at the 2025 price level.

Scenarios for electricity demand and electricity generation

Estimates of the effects of state aid on the electricity system are based on a comparison between the cost of generating at least 300 TWh in 2045 with the electricity system assumed to ensue from new nuclear power with state aid, and the cost of an electricity system without new nuclear power. Just like in the impact assessment in the memorandum, Svenska kraftnät's long-term market analysis (LMA 2024-01-26) is one of the sources for determining the trend in the generation mix. The analysis includes two 'electrification scenarios' that meet the Government's planning target. In one of these, existing nuclear power will be phased out as the plants reach the end of their life, and the Government's planning target is met by an extensive expansion of onshore and offshore wind power. This is the *Elektrifiering Förnybart (EF)* (Electrification: Renewables scenario). This is seen as the zero option in the impact assessment. In the second scenario, the life of existing nuclear power plants is extended while investing in both new nuclear power and onshore and offshore wind. This is the *Elektrifiering planerbart (EP)* (Electrification: Plannable) scenario.

In both scenarios, wind power is expanded significantly from today's roughly 40 TWh to 170 TWh onshore wind power, and 67 TWh offshore wind power up to 2045 in the EF scenario, and 96 TWh onshore and 24 TWh offshore wind power in the EP scenario. In the EP scenario, nuclear power produces 110 TWh in 2045, which is slightly more than double the current capacity. Assuming that power plants whose lives have been extended to 80 years account for about 50 TWh, about 60 TWh would come from new power plants, which is about 20 TWh more than the generation from the plants assessed as being covered by the proposed aid. In the impact assessment, the entire expansion of new nuclear power is nevertheless seen as a result of the aid. However, the generation from nuclear power plants with extended lives is not seen as a result of the aid.

The differences between the EP and EF scenarios can only be assumed to derive in part from the effects of the introduction of the aid, which is also highlighted in the consultation response from the *Swedish Energy Agency*. The *Energy Markets Inspectorate* agrees with the memorandum's assessment that the effects on the electricity system's costs as well as on the price of electricity are difficult to appraise. The Government shares this assessment and therefore, as in the memorandum, the impact

assessment draws mainly qualitative conclusions from the comparisons between the two scenarios when it comes to the impact of the aid.

A number of consultation bodies including the *National Institute of Economic Research* and the *Swedish Environmental Protection Agency,* would like to see a socio-economic analysis. The Government argues that many external factors in the time perspective to 2045 are subject to considerable uncertainty, which complicates a strictly quantitative socio-economic analysis. *Svenska kraftnät* argues that significant uncertainty would remain about developments in the electricity market even with a solid socio-economic analysis.

For the impact assessment of the CfDs, the *Färdplaner mixat (FM)* (Roadmaps: Mixed) scenario from Svenska kraftnät's LMA is also used. The FM scenario assumes that in 2045, nuclear power generation will still be at roughly the same volume as today, and that consumption will lie below the Government's planning target. Although the FM scenario does not attain the volume needed for the planned electricity consumption, this scenario is used for a sensitivity analysis of the CfDs to illustrate a scenario with lower electricity prices.

Costs for new nuclear power

The impact assessment is based on the same assumptions about the expected construction and operating costs of new nuclear power as presented in the memorandum's reference scenario, with the only difference being that they are uprated to 2025 prices with the Consumer Price Index (CPI). By uprating the costs with the CPI, they are comparable to the price level specified in Svenska kraftnät's LMA scenarios, but they should not be seen as an assessment of what constitutes a fair price index for nuclear power's input goods.

A number of consultation bodies including *Chalmers,* the *Swedish Energy Markets Inspectorate, SWEA, Uniper* and the *Swedish National Debt Office* expressed views on the assumptions made in the memorandum regarding the costs for new nuclear power. Some consultation bodies argue that the costs assumed in the memorandum's reference scenario underestimate the expected costs, while others would like to see a clearer sensitivity analysis if the assumptions do not turn out to be correct.

The Government shares the conclusions in the memorandum, that there is considerable uncertainty surrounding the assumed costs in the reference scenario, but that it is not possible to obtain a more accurate estimate of the expected costs than the one given in the memorandum. The impact assessment is therefore based on the same expected costs but, like the memorandum, includes sensitivity analyses in a scenario with cost overruns and delays (see Section 8.6.4).

The memorandum takes into account both national and international studies that have estimated the costs of the construction and operation of new nuclear power. As set out in the memorandum, there are many indications that costs have increased in recent years, in part due to higher prices for nuclear input goods, which means that even relatively recent studies risk underestimating the costs. In light of this, the Government assesses that the approach in the memorandum – where historical data

from studies is combined with more forward-looking assessments from industry actors and experts – is reasonable.

Of particular importance for the Levelized Cost of Energy (LCOE) from new nuclear power is the cost of construction cost, construction time and the discount rate used to calculate the present value of cash flows. The construction costs in the memorandum's reference scenario, excluding overnight costs, are assumed to amount to SEK 80 million per MWe at 2023 prices for large-scale reactors, given that an actor builds installed generator capacity of at least 2 000–3 000 MWe of the same reactor model at the same site. After uprating to the 2025 price level, the corresponding assumption amounts to just under SEK 83 million per MWe. It can be noted that this level is higher than, for example, Energiforsk, Svenska kraftnät and the Swedish Energy Agency assume for new nuclear power in their analyses (see for example Energiforsk report 2021:714, p. 27). At the same time, the level is lower than can be observed in a number of ongoing and recently completed European nuclear power projects. In the memorandum, the construction period is assumed to be 7 years, which corresponds to the upper end of the range adopted by Energiforsk (5–8 years) but, as the *National Debt Office* notes in its consultation response, it is a shorter construction period than the average for recent nuclear power projects. The discount rate in the memorandum's reference scenario amounts to 7% in real terms, which is above Energiforsk's assumption of 6%.

Given these assumptions, the LCOE for new nuclear power in the memorandum's reference scenario is calculated at 110 öre per kWh (SEK 1 = 100 öre). With the same assumptions as in the memorandum, the LCOE in the reference scenario is calculated at 113 öre per kWh after an uprating to the 2025 price level. The Government Offices' calculations also show that if the expected construction costs were instead to amount to, for example, SEK 100 million per MWe, corresponding to 25% higher than assumed in the memorandum, the LCOE would be 133 öre per kWh. If the construction period is extended to 10 years, it would instead be 124 öre per kWh. With such a concurrent increase in the construction cost and extension of the construction period, the LCOE would be 146 öre per kWh.

The Government assesses that the costs, construction time and yield requirements of the nuclear power are likely to vary between projects and over time. For example, they depend on the size of the project, the type of reactor and what economies of scale can be achieved over time through learning lessons from previous projects. The Government therefore argues that assessments of the LCOE for nuclear power, but also for other types of power such as offshore wind, should be seen as estimates associated with considerable uncertainty.

Parameter values in the financing and risk-sharing model

The impact assessment is based on the parameter values proposed in the memorandum for the central government loans, the CfD and the risk- and earnings-sharing mechanism. As outlined in Section 5, the Bill does not contain proposed parameter values, which are instead decided in negotiations between central government and a project company.

The discount rate used in the calculation of the LCOE refers to the weighted cost of capital (WACC) which depends on the proportions of debt capital and equity capital, and the yield requirements for these. Unlike, for example, construction costs and the construction period, the design of the financing and risk-sharing model has a direct impact on the discount rate. A distinction therefore needs to be drawn between the LCOE that is expected without, or with limited, state aid, and the LCOE that can be expected under the proposed financing and risk-sharing model. The assessment in the memorandum is that the financing and risk-sharing model with the proposed parameter values should be able to reduce the real discount rate to 4% over the entire investment period, compared with the 7% assumed in the reference scenario and not taking the state aid into account. The lower discount rate is a consequence of central government loans with subsidised interest rates and that the yield requirement on equity capital also decreases when the project company is relieved of certain risks. The lower discount rate explains why a strike price of 80 öre per kWh in the memorandum is considered sufficient despite the fact that the LCOE in the reference scenario, with the same assumptions otherwise, amounts to 110 öre per kWh.

The Government Offices have made corresponding calculations of what the strike price would need to amount to at a higher construction cost and longer construction period. To begin with, it has been noted that a strike price of 80 öre per kWh, all other assumptions remaining unchanged, is still deemed sufficient after the construction and operating costs were uprated with the CPI to the 2025 price level. This is because the underlying market price for electricity has also been uprated, which gives the project company a higher expected revenue after the CfD has expired. If the construction cost were to be higher than the basic assumption and, for example, amount to SEK 100 million per MWe, the strike price in the CfD would have to be 95 öre per kWh to correspond to a real discount rate of 4%. If instead the construction period is extended to 10 years, the strike price, all else being equal, would need to be set at 85 öre per kWh. With such a concurrent increase in the construction cost and extension of the construction period, the strike price would be 102 öre per kWh. It should be pointed out that the calculations above assume otherwise unchanged parameter values, for example in terms of capital structure and the interest rate on the central government loans. In practice, all parameters will be determined simultaneously to provide a fair, risk-adjusted return to the project company's owners. For example, if the share of debt capital is determined at a higher level than assumed in the memorandum, 75%, it would result in a lower discount rate and the strike price could be set at a lower level with retained yield.

The Government makes no other assessment than that in the memorandum concerning the strike price being required to provide investors with a sufficient expected return to enable investments in new nuclear power. On the other hand, the Government considers that, due to the great uncertainty especially in terms of construction costs, construction period and yield requirements, there is reason to highlight the impact of a range of differences between the strike price and the market price of electricity (see Sections 8.2.2, 8.5 and 8.6.7).

8.2 Effects on the electricity system's costs and electricity prices

The electricity system's costs can be divided into generation costs, system operation costs, flexibility costs and network costs.

The memorandum presents the results from studies that show that, at the power plant level, it costs more to generate nuclear power than other types of power. But there are also examples of studies which indicate that the costs of offshore wind power are similar to those of nuclear power (see also Section 8.2.1). In this context, it should be stressed that nuclear power contributes to reduced system costs through its capabilities which can contribute greatly to operational security in all system states and time perspectives, as well as through a reduced need to expand the electricity network because nuclear power can be built close to where the electricity is consumed.

Svenska kraftnät points out that, to some extent, investments in new nuclear power that are financed by Swedish electricity consumers and taxpayers will result in benefits in other countries. The *Confederation of Swedish Enterprise* contends that since Swedish taxpayers and electricity users will bear the main risk and put up the financing for new nuclear power in Sweden, a large share of the benefits should accrue to them and an expanded market integration should be assessed in light of this. *E.ON, LO* and *Svemin AB* point out that consumers in other countries and foreign exporters should participate in the financing, as the majority of the benefits of the investment may accrue to parties abroad. *Ellevio* also contends that how the electricity that goes to export can be included should be investigated. The Government assesses that the benefits of new nuclear power in Sweden will primarily accrue to Swedish businesses and Swedish households. New fossil-free, plannable electricity generation in Sweden could marginally replace electricity from fossil-fuelled power plants in neighbouring countries, which is also positive. In this context, the Government wishes to emphasise that, since Sweden is part of the EU's internal market for electricity, it means that changes in benefits in other countries arise in connection with virtually all types of investment in the electricity system, and also in the decommissioning of plants and installations. This applies, for example, to investments in electricity generation plants, installations that consume electricity, and power lines. This was also the case with the electricity certificate system and the corresponding applies in the case of decommissioning, investments and support schemes in other EU Member States. At the same time, when the Government examines cases concerning electricity interconnectors, it also takes into account how this will affect the electricity market both in Sweden and abroad. For certain types of energy infrastructure projects, there are EU provisions governing cross-border cost allocation (TEN-E Regulation (EU) 2022/869), but it does not include investments in nuclear power. It is also possible for foreign participating companies to invest in a project company receiving state aid, provided that they satisfy the conditions. In this context, it should also be added that there are provisions (see, for example, the Risk Preparedness Regulation (EU) 2019/941) to support neighbouring countries, in critical situations involving electricity

supply, which all countries should aim for in the transition to a fossil-free electricity system. This is facilitated by an increased amount of plannable electricity generation in the electricity system.

The *National Board of Trade of Sweden* would like to see an analysis of how cross-border trade in electricity is affected by the proposal. Even though no quantitative analysis has been carried out, the Government assesses that new nuclear power will contribute to more stable prices and less need for fossil electricity generation in northern Europe in situations where the grid is under strain and prices are high, compared to the case where the increased electricity generation instead came from using weather-dependent types of power – in particular if the proportion of weather-dependent electricity generation increases in our neighbourhood.

8.2.1 The electricity system's costs

Generation costs

When comparing the average cost of electricity generation in an electricity system with and without nuclear power, it can be expected that new nuclear power will primarily replace the most expensive alternatives. In the EP scenario, electricity generation from offshore wind power is 43 TWh lower than in the EF scenario for 2045. The report from Energiforsk mentioned above presents a comparison of the costs between different types of energy. Energiforsk's study shows that the cost of offshore wind power is negligibly lower than that of nuclear power (Report 2021:714 pp. 19 and 27). Since the study was conducted, the cost of all types of energy has increased and there are many indications that the costs for offshore wind power have also increased. Although comparisons between prices in auctions are difficult to make due to different circumstances and conditions, there are nevertheless indications of this in results from reverse auctions, e.g. from the UK, where prices have reached over 100 öre per kWh. Although the cost of offshore wind power is uncertain, and varies greatly between different offshore areas due to, for example, logistics conditions and connection possibilities as well as sea depths and sea floor conditions, there are many indications that it is significantly more expensive than onshore wind power and more on par with nuclear power.

Furthermore, the value of electricity supplied should also be taken into account when comparing the types of power. Nuclear power supplies more electricity than wind power during high-price hours when the grid is under strain. This is linked to the plannability of nuclear power when the demand for electricity is high, i.e. during the winter months when it is coldest, but also at times and during periods when weather-dependent types of power are not able to generate. The Government's calculations confirm this. If electricity is estimated at the spot price, during the period 2022–2024 nuclear power has had a 33% higher capture rate, i.e. average revenue relative to the average price of electricity, compared to wind power.

Despite the uncertainties, the Government's overall assessment is that the average cost of electricity generation in the electricity system with an additional 5 000 MW of nuclear power will be at a level comparable to an expansion based on offshore wind power.

The net costs of Frequency Control Ancillary Services (FCR-D, FCR-N, mFRR and aFRR) have increased sharply in recent years, from just under SEK 1.5 billion per year in the period 2018–2020 to about SEK 6 billion per year in 2022 and 2023. The increased share of weather-dependent electricity generation in recent years has contributed to greater imbalances and a need for increased volumes of ancillary services, but the cost increases for ancillary services that have been mainly due to higher electricity prices. Discontinued plannable electricity generation during the period has also contributed to this development. *SWEA* points out that the cost of ancillary services for balancing the grid will remain at around the same level in 2023 as in 2022, despite a 40% increase in volume.

Svenska kraftnät's analyses show that the EF scenario has a significantly greater need for Frequency Control Ancillary Services (FCAS) than the EP scenario. Costs for the greater need for FCAS are not reported by Svenska kraftnät, but in the memorandum they are assessed to be relatively small.

In the case of non-frequency ancillary services (voltage, rapid dispatch of reactive power and short-circuit current), the memorandum states that the requirements for developing new solutions are significantly greater in the EF than in the EP scenario, but that the costs of these capabilities have not been analysed by Svenska kraftnät. The memorandum also states that the network capacity to and from bidding zone 3 (SE3) has been limited since 2021 for operational security reasons, partly due to less nuclear power in the electricity generation mix. The *Swedish Energy Agency, Svenska kraftnät* and others point out that there are and may be other solutions that can contribute the capabilities that nuclear power can provide. The *Swedish Competition Authority* also recommends alternative measures in the first instance, in order to ensure an efficient electricity supply, such as the development of markets for eligible ancillary services. In the case of voltage control, for example, Svenska kraftnät have reported that power electronics-connected power plants currently have the capability to regulate voltage, even when the plant does not produce any active power, which mostly has a positive impact on the power system's voltage stability. Svenska kraftnät also brings up the fact that as grid-forming inverters become a reality, it presents a great opportunity to design these so that they contribute similar or better properties than a synchronously connected plant does. It is also clear that work is under way between transmission network operators in the EU on the development of a technical definition of grid-forming units. Furthermore, *Bodecker Partners* and *SWEA* contend that there are cost-effective alternatives for covering the rotational energy losses.

The Government welcomes this technological development, which will further strengthen the electricity system along with the types of power that already contribute such properties. The development of grid-forming inverters is interesting, but it is currently difficult to assess the future costs of this technology and how it would burden the network collective. In addition, the electricity system is affected by the introduction of power electronics, including through the emergence of new stability problems.

The geographical perspective is highlighted by the *Swedish Energy Markets Inspectorate*, which argues that locational signals in the electricity market would disappear with the proposal. The Government agrees that new nuclear power needs to be placed in favourable locations from the perspectives of the electricity system and electricity market. As stated in Section 5.4.1, the Government will conduct a comprehensive examination of applications for the financing of new nuclear power. This includes making assessments concerning their geographical locations. Furthermore, location is one of the aspects that may be weighed in when assessing the parameter values in the financing and risk-sharing model. Svenska kraftnät's task in its 2025 appropriation directions concerning planning for increased electricity use will also be an important part of this, and includes making it apparent to electricity market actors where electricity generation should be connected.

All in all, the Government assesses that new nuclear power will reduce the system operation costs associated with both frequency control ancillary services and non-frequency ancillary services, and by facilitating the work of managing a power system with an increasing element of non-synchronous electricity generation and consumption connected to it.

Flexibility costs

One conclusion that can be drawn from Svenska kraftnät's LMA is that significant flexibility resources will be required, regardless of nuclear power's share in the system. The Government assesses that in order for the electricity system to be used more efficiently, the system needs to be more flexible. In the LMA, Svenska kraftnät emphasises that a larger proportion of renewable generation creates a less predictable power system and increases the need for all resources in the power system to be more flexible. The analysis does not include the additional costs for this, but the memorandum highlights that other studies indicate that the cost of more flexibility may be significant. The Government therefore assesses that new nuclear power will reduce the cost of flexibility in the electricity system.

Network costs

In its latest (2025) operational plan including its investment and financing plan, Svenska kraftnät states that planned investments for the period 2026–2028 amount to SEK 56.8 billion. In its latest system development plan, Svenska kraftnät states that planned investments during the period 2022–2031 will amount to approximately SEK 100 billion. More nuclear power in the electricity system that can be located in energy balance deficit areas reduces the need to build transmission networks, which leads to reduced costs and thus lower grid charges for electricity users. The location of wind power generation is largely determined by windy conditions, while nuclear power sites can be planned to benefit the system to a greater extent. Svenska kraftnät's LMA shows a greater need for network expansion with a greater share of renewable electricity generation. The Government assesses that an advantageous location of new nuclear power will also enable the connection of more electricity consumption to the network (see Section 4.1). All in all, this means that if new nuclear power is established close to consumption, the costs of network expansion will not need to be

as high as compared to a scenario where no new nuclear power is built. However, it is difficult to quantify the impact. In the memorandum, an estimate of around 2.7 öre per kWh is made, which is considered to be an underestimation since it is based on a study where the assumptions do not reach the Government's planning target for the electricity system.

Regarding the costs of the electricity system, *Seko, SKGS* and *Uniper* contend that a balanced power system consisting of hydropower, nuclear power, wind power and solar power probably provides the lowest total electricity cost. *Fortum* refers to the U.S. Department of Energy having estimated that the inclusion of new nuclear power, in addition to weather-dependent electricity generation and storage solutions, reduces the total electricity system costs. All in all, the Government assesses that up to at least 5 000 MW of new nuclear power will reduce the total electricity system costs compared to a scenario where no new nuclear power is built. Whether or not the total cost for the electricity system will continue to fall if more new nuclear power is added beyond that is more difficult to assess at present.

8.2.2 Electricity prices

Spot prices

The day-ahead market, often referred to as the spot market, is the main market for trade in electricity. In this market, players submit their buy and sell bids every hour, and where these bids meet establishes the market price and the volume of electricity will be traded hour for hour during the next 24 hours. The market price provides an important signal to market players. For example, a high price signals scarcity and generators are then spurred to generate more electricity. As described in Section 5.1.2, this incentive remains with a financial CfD. This kind of CfD can be designed to avoid weakening the incentives that reduce generation at low electricity prices.

Nuclear power is characterised by low short-term marginal costs and generally helps to lower electricity prices in the spot market. A number of consultation bodies including *Uniper* and *SWEA* argue that increased electricity generation from nuclear power could lead to a sharp drop in the price of electricity. The Government's point of departure is that the energy transition will entail a sharp increase in demand for electricity. With increased demand, the price will rise to a more long-term marginal cost where the price provides sufficient profitability when new investments are made in electricity generation facilities.

The memorandum identifies small differences in average prices in Svenska kraftnät's EF and EP scenarios, where the EP scenario results in a 1.5% higher average price in 2045. It should be noted that connection cables for offshore wind power have not been included in the cost estimate for this type of power in the EF scenario, suggesting that the average price in this scenario may be underestimated. The memorandum also highlights other studies which indicate that the market price will be lower with a larger share of nuclear power. The report *Modellanalys av framtida elpriser och intjäningsförmåga för olika kraftslag* (Model analysis of future electricity prices and capture rate for different types of power) from

Profu, produced as part of the NEPP research programme in February 2025, also highlights – with the proviso that the sensitivity of the cost assumptions is high – that a system with new nuclear power in place exhibits an annual average price that is lower than a system without new nuclear power.

All in all, the Government shares the conclusion in the memorandum that it is difficult to say anything unambiguously about how new nuclear power would affect the average price of electricity in the long term compared to another development pathway where no new nuclear power is built, but that there is much to indicate that a larger share of nuclear power would lead to a lower average market price.

Costs for end customers

As outlined in Section 5.1.2, the Government considers that the costs incurred by central government under CfDs between central government and project companies should be distributed on the basis of the benefits that arise. One possible way to achieve this is to distribute the costs in proportion to electricity consumption. The *Swedish Energy Agency* considers that the costs for electricity customers, in particular those linked to the CfD, have not been sufficiently investigated in the memorandum.

In the memorandum, the potential cost of the CfDs is estimated using the assumed electricity price in 2045 for bidding zone SE3 in the EP scenario in the LMA. The Government Offices have made a similar estimate but for the assumed electricity price for the entire country instead of SE3, and with the electricity price uprated to the 2025 price level because the electricity price in the LMA was given at the 2020 price level. The estimated cost of the CfDs at the electricity prices from both the EP scenario and FM scenario (Roadmaps: Mixed), which Svenska kraftnät describes in the LMA, is presented as the sensitivity analysis. In the FM scenario, electricity consumption amounts to 251 TWh and is thus below the Government's planning target of being able to satisfy an electricity consumption equivalent to at least 300 TWh. Based on the strike price in the CfDs being set at 80 öre per kWh, the electricity price in the EP scenario would mean that the compensation for the CfDs would amount to an annual income of SEK 1.4 billion, while the electricity price in the FM scenario, with a lower electricity consumption, would entail a cost for central government of SEK 7.5 billion. If the cost were to be passed on to the consumer collective based on the assumed electricity consumption in each scenario, EP would mean that consumers would get back 0.4 öre per kWh consumed, while FM would mean a cost equivalent to 3 öre per kWh (see table 8.1). The compensation would be greater if electricity prices were lower than in the FM and EP scenarios, or if the strike price were higher. However, the expected energy transition does not suggest very low electricity prices. The amount of the compensation is proportionate to the difference between the electricity price and the strike price. Section 8.5 describes the potential costs of the CfDs for households.

Table 8.1 Calculation example for potential costs for CfDs

Scenario	Electricity consumption	Electricity price	Difference from assumed strike price	Compensation	Compensation – detached house	Compensation – apartment
	TWh	Öre/kWh	Öre	Öre/kWh	SEK/month	SEK/month
FM	251	61	19	3.0	45	10
EP	344	83	-3	-0.4	-6	-1

Note: The electricity prices assumed by Svenska kraftnät for the two scenarios have been uprated to the 2025 price level. The costs are estimated based on an electricity consumption of 18 000 kWh for a household living in a detached house and 4 000 kWh for a household living in an apartment.

Sources: Svenska kraftnät and own calculations.

Bodecker Partners, LTU, IFN, IVA, KTH researchers, the *Swedish Society for Nature Conservation* and *Svenska kraftnät* all highlight great uncertainties about future electricity demand and state that there is no sensitivity analysis with electricity consumption lower than around 200 TWh. A key aspect of the purpose of aid to new nuclear power is to enable the green transition while preserving Sweden's competitiveness. Should electrification be delayed or prove unnecessary for reasons that are currently unforeseeable, the pace of the expansion of new nuclear power can be adjusted. The Government will conduct a comprehensive examination of applications for state aid. This includes assessing the future demand for electricity. This can also affect the timing of the Government being prepared to make a decision to grant aid. There is therefore nothing to prevent aid under the financing and risk-sharing model being utilised in a way that will result in a gradual expansion of nuclear power.

In the event that future electricity prices in the market are lower than expected, this does mean of course that the cost of the CfD increases. At the same time, the total cost of electricity is most affected by the market price being lower, since only part of the generation is new nuclear power covered by the hedging agreement.

All in all, the Government assesses that the cost of the CfD results in electricity customers having some protection against high electricity costs, partly through a general reduction in the spot price compared to a situation without new nuclear power, and partly through compensation when electricity prices rise above the strike price in the CfD.

8.3 Effects on different types of power

A number of consultation bodies such as the *Swedish Energy Markets Inspectorate,* the *Swedish Energy Agency* and *the Swedish Environmental Protection Agency* are of the opinion that how the proposal will affect and supplant other investments in power generation and flexibility has not been satisfactorily analysed in the memorandum. Several consultation bodies, including the Swedish Energy Markets Inspectorate and the Swedish Energy Agency, argue that the proposal may reduce interest in investing in renewables. *100 % Förnybart* raises the risk that existing electricity

generation will be phased out and that the market interest in investing in new renewable electricity generation will be radically reduced, or will cease altogether. *Bodecker Partners* and the *Swedish Society for Nature Conservation* hold the view that the proposal locks Sweden into one technology for a very long time.

Uniper considers that if the assumption of 300 TWh turns out to be incorrect, there is a risk that periods of large electricity surpluses may occur, leading to low prices that challenge the profitability of existing generation, which is why the company would like to see an analysis of the need to design aid measures adapted for other generation as well. *Fortum* also considers that it is important to leave room for the possibility that measures may be needed to assure existing electricity generation in the event that periods of oversupply arise before new demand has arisen.

Svenska kraftnät and the Swedish Energy Agency highlight the consequences of a lower level of electrification by 2045 and point out that the proposal could have significant effects on other investments in the electricity system. They also point out the risk of an oversupply of generation, which would push down electricity prices and revenues for other generators. Several consultation bodies including heart *SWEA* and Bodecker partners, identify the risk that demand for electricity will not increase at the same rate as the expansion of nuclear power, which would lead to pressure on prices. *Swedenergy* and Uniper also assess that a condition of investing in new nuclear power should be that it does not displace existing electricity generation or reinvestments in it. *E.ON* assesses that aid to new nuclear power will worsen the conditions for all other electricity generation, such as new co-generation in southern Sweden, but also existing co-generation. *Vattenfall* contends that poorly timed aid to new nuclear power could lead to electricity prices that are too low, which could supplant investments in existing generation or other types of power. Uniper assesses that there is a risk of a displacement effect when it comes to extending the operational life of existing nuclear reactors. Svenska kraftnät also argues that the proposal risks reducing profitability and inhibiting extending the operational life of existing nuclear power plants. Fortum notes that 4 000–6 000 MW represents a minority share of the additional electricity generation needed to meet the expected increase in demand for electricity.

The Government assesses that the aid should cover up to about 5 000 MW of new nuclear power, which is estimated to correspond to about 39 TWh of electricity generation per year. In relation to the need to significantly expand electricity generation to meet the anticipated demand for electricity, the Government notes that over and above this future nuclear power generation, a significant expansion of new electricity generation will be needed. This also includes the need to replace current electricity generation plants as the need arises. The Government therefore makes the assessment that investments in new nuclear power partially replace the need for other types of power, but it is also assumed that the demand for electricity will increase significantly more than 39 TWh. The Government therefore argues that electricity generation from renewable types of power must also rise sharply if consumption increases up to 300 TWh. In Svenska kraftnät's EP scenario, which entails around 60 TWh of new nuclear power, wind power increases by about 250% by

2045 and nuclear power by about 135% compared to electricity generation in 2023. The share of wind power in the generation also increases from 20% in 2023 to 36% in the scenario that includes an expansion of nuclear power.

An increased supply of electricity leads to the average electricity price being lower than if the increase had not occurred. At the same time, demand for electricity is expected to increase greatly. Prices can then be expected to be higher, especially if not enough new electricity generation is added. Thus, in contrast to Svenska kraftnät and Uniper, the Government also shares the assessment in the memorandum that the risk of the proposed aid model supplanting the extension of the life of existing nuclear reactors is small, since the capital cost and project risk of extending the life of an existing nuclear reactor are significantly lower compared to investments in new nuclear power.

Bodecker Partners argues that there is a risk that electricity generation and electricity consumption in the coming years may end up out of step given the rapid expansion required. Uniper proposes that an urgent inquiry should be carried out to ensure that future new generation is in step with future consumption. Vattenfall also points out the importance of electricity generation expanding instep with industry's transition. The Government considers that the long-term development of electricity prices is difficult to assess and that larger investments that take time to implement but ultimately contribute positively to the electricity system and electricity supply for a significantly longer period are also needed. Electricity generation needs to be in place before the demand for electricity can be met. That means taking a certain amount of risk. At the same time, the risks of Sweden losing industries to other countries, or not being able to attract new industries that demand fossil-free electricity, are assessed to be greater without these investments.

In its consultation response to the memorandum *Ny kärnkraft i Sverige – ett första steg* (New nuclear power in Sweden – a first step) from 2023, Svenska kraftnät contended that an increased amount of plannable electricity generation facilitates the connection of more renewable electricity generation. With a larger share of wind power in the electricity generation, wind power will have a lower average capture rate as prices are lower when it is windy, and the wind turbines are generating electricity However, if the increase in electricity generation comes from wind power instead of nuclear power, it is highly likely that this would lead to a lower capture rate for the wind power. The Government Offices estimate that the capture rate – at prices in the day-ahead market – for wind power in Sweden has gone from 98% in 2012 to 72% in 2024. This means that the market price in 2024 must be 40% higher than the generation cost for it to be worth constructing wind farms. In a study of Danish wind power, the capture rate in bidding zone 1 in Denmark (DK1) was forecast to be 40% (2040) if the expansion happens as planned (EIFO 2023). With an increased wind power share, there will be more hours when wind power shuts down, which is when the electricity price is lower than the marginal cost of operating the wind farm, which means higher costs per kWh generated. This means that a higher average market price is needed for new wind turbines to be profitable. One can also expect that the marginal cost of wind power will increase the more it is expanded, as the most

favourable locations are utilised first. Although the effect on wind power's profitability is difficult to assess, it does not exclude the possibility that a larger nuclear power share in the generation mix would increase the profitability of new investments in wind power because a higher capture rate can be achieved at lower market prices than was the case with a larger wind power share.

8.4 Impact on the business sector

A stable electricity supply is central to Swedish companies' competitiveness. According to the report *The cost of electricity supply interruptions and value of lost load in Swedish electricity-intensive industrial plants* from the Swedish Agency for Growth Policy Analysis (Growth Analysis), the economic effects of power outages and supply interruptions for electricity-intensive industries are significant (WP 2024:05). The report's estimate of the economic impacts shows that the cost far exceeds estimates that use traditional metrics such as the Value of Lost Load (VOLL). Short interruptions are disproportionately costly, and many businesses report lingering effects of even a one-hour outage.

In some cases, the business is unable to fully recover even a year later. Many companies and industries have reported on the economic impact of both longer power outages and shorter interruptions. The most recent resource adequacy assessment (ERAA, 2023) carried out by the European Network of Transmission System Operators for Electricity (ENTSO-E) shows that the risk of power shortages in the coming years is rising in southern Sweden (bidding zones 3 and 4), and that the risk exceeds the reliability standard adopted by the Government of one hour per year. In the short term, the Government has made the assessment that there should be a capacity mechanism for the electricity market in Sweden even after 15 March 2025. At least for a transitional period, the capacity mechanism should be a strategic reserve (Govt Bill 2024/25:48, p. 11). In the longer term, and in light of an expected sharp increase in electricity consumption, the Government assesses that more plannable electricity generation needs to be built to strengthen resource adequacy and reduce the risk of power shortages.

Increased electricity generation is a necessity for the green transition and for economic activity to be able to continue producing in Sweden when fossil emissions are phased out by the EU's emissions trading scheme for example. The proposal makes it more credible that electricity generation will increase and enable a green transition through electrification. Reduced uncertainty in the business sector increases the inclination to make long-term investments which mean that production can remain in Sweden.

How the business sector is affected by increased electricity generation as a result of new nuclear power is determined by how price levels, price fluctuations, availability and costs develop. With an increased amount of nuclear power in Sweden's electricity generation, price fluctuations are expected to decrease. A stable supply of electricity across all hours of the day and night reduces the need for industry to apply flexible electricity

consumption. Reduced price fluctuations and a more predictable electricity system should also contribute to lower costs for hedging the electricity price for the business sector.

The *Swedish Energy Markets Inspectorate* and *Statkraft* assess that new nuclear power producers that are already hedged through CfDs will not have any incentive to enter into other hedging arrangements or trade on the futures market. *Bodecker Partners* assesses that the proposal makes it more difficult for Swedish industry to hedge the price, which is crucial for loan financing for example.

One of the fundamentals specified by the Government for the design of CfDs in Section 5.1.2 is that the needs of electrification, such as the need for hedging for other actors, should be taken into account. For example, this might concern industry's need to sign hedging agreements to enable the transition and electrification of industry.

As mentioned earlier, there are reasons why lower market price levels may result from investment in new nuclear power with state aid, which benefits the business sector's competitiveness in general and energy-intensive industry in particular. With increased demand for electricity, prices are expected to increase compared to the current situation, but the price increase is dampened by an increased amount of nuclear power being added through the application of the financing and risk-sharing model.

If the annual market price were to be lower than the strike price in the CfD and the cost distributed among electricity consumers, this would entail a cost for the business sector. Whether that cost is higher or lower than the non-nuclear option depends on the price that the replacement generation otherwise would demand, the costs of flexible electricity consumption, and the system costs in the two scenarios. If the market price is higher than the strike price in the CfD, a revenue arises that will be used to reduce end-customer costs, which would mean lower costs for the business sector than if no CfD had been entered into.

It is difficult to appraise future electricity prices and the total cost in different scenarios, and thereby to unambiguously establish how the business sector would be affected as a result of the CfD, given that any costs are distributed among the electricity consumers. However, the costs for system operation, flexibility and network expansion could be lower in the event that the share of weather-dependent types of power gets smaller. Since ancillary services and network expansion are paid for by the electricity consumers, in this respect new nuclear power will be positive for the business sector.

Being able to connect to the network is another important factor for companies to expand and transition. Additional nuclear power generation allows a relatively larger power draw at a given level of resource adequacy compared to other types of power (see Section 4.1). In addition, nuclear power has the advantage that in many cases it can be located closer to the electricity consumption than renewable alternatives, which should lower the business sector's connection costs for new electricity consumption.

8.5 Effects on households

The effects of new nuclear power with state aid on households largely coincide with the effects on the business sector. The impact on the business sector then also has an effect on households, largely through effects on the labour market. To the extent that new nuclear power means that the business sector has increased options for connecting to the electricity network, less variable access to electricity and lower electricity costs, households can be assumed to benefit from greater demand for labour. This could mean more opportunities for employment for households and higher incomes. These potential effects are very difficult to appraise. As mentioned, the proposal could lead to lower electricity prices, which would benefit households. Furthermore, as has also been mentioned, the proposal could lead to lower network tariffs, which would also benefit households.

How a potential central government cost for CfDs should be financed needs further analysis. If the cost were to be passed on to the consumer collective in proportion to their electricity consumption, as proposed in the memorandum, it would also be paid by households. The monthly cost that would be borne, in that case, by a household living in a detached house or apartment, given the FM and EP scenarios, and given a strike price of 80 öre per kWh for the CfDs, is shown in table 8.1. In the EP scenario, the compensation for the CfDs would lead to a monthly income of about SEK 6 for a household living in a villa and SEK 1 for a household living in an apartment. In the FM scenario, the compensation would instead lead to a monthly cost of about SEK 45 for a household living in a villa and SEK 10 for a household living in an apartment. The amount of the compensation is proportionate to the difference between the electricity price and the strike price. Therefore, the compensation would be greater if electricity prices were lower than in the FM and EP scenarios, or if the strike price were higher than 80 öre per kWh. The potential cost per consumer would also depend on the total electricity consumption across which the cost is distributed. There is uncertainty about both future electricity prices and the strike price of the CfDs. However, the expected electrification does not suggest very low electricity prices. The amounts of households' potential costs in table 8.1 should be seen as a calculation example that illustrates how the costs are predicated on the difference between the electricity price and the strike price as well as total electricity consumption. In these examples, a household's electricity consumption is assumed to be 18 000 kWh per year for a villa and 4 000 kWh per year for an apartment. The lower the electricity price, the higher the cost of the CfDs would be. The total cost of electricity for households is influenced more by the price of electricity than by the costs for the CfDs, since the CfDs only apply to part of the total electricity generation. Therefore, low electricity prices always benefit households.

8.6 Effects on general government finances

In this section, the Government presents the potential effects on general government finances of investments in nuclear power emanating from the proposed model for central government financing and risk-sharing, i.e. the effects of the state aid and of the inception of the nuclear power plants. The effects on general government finances are calculated based on a number of assumptions, such as the costs and time profile of investments. The impact on general government finances is presented for several scenarios, with differences in capital costs and in the reporting of statistics for the state aid to the investments.

8.6.1 Assumptions for general government finances calculations

Assumed figures for construction and operation

The construction cost for new nuclear power is assumed to be just under SEK 83 million per MWe, which corresponds to the assumption in the memorandum uprated by the Consumer Price Index (CPI) to the 2025 price level. In the account of effects on general government finances, it is assumed that aid would be granted to investments in 5 000 MWe at a total capital cost of SEK 413 billion. The aid can be granted to investments in reactors of different sizes, but in the calculation of the impact on general government finances, it has been assumed that the aid is granted to investments in four large-scale reactors, where each reactor has an output of 1 250 MWe and capital cost of approximately SEK 103 billion.

The final parameter values, such as the CfDs' strike price, interest rates, and central government's share of the financing, will be established at a later stage when the conditions, such as the estimated building costs, for a specific project are known. As with the capital costs for nuclear power, in the budgetary impact assessment the Government has used the parameter values adopted in the memorandum and uprated them by the CPI to the 2025 price level. Even when the project companies' revenues and expenses for construction and operation have been converted to the 2025 price level, a strike price of 80 öre per kWh for the CfDs is calculated to provide the same expected yield as assumed in the memorandum. The description of the effects on general government finances also assumes that the compensation for the CfDs is made balance-neutral and does not affect net lending or the general government consolidated gross debt. It is also assumed that the central government loans finance 75% of the capital costs. This is equivalent to SEK 315 billion for investments in four reactors. Beyond the uprating to 2025 prices, the Government sees no reason to deviate from the main parameter values adopted in the memorandum when calculating the effects on general government finances.

Rate of investment and construction period

The described effects on general government finances assume a scenario where investments corresponding to four large-scale reactors are

implemented but that no more than two of these reactors are built in parallel. The investment phase is assumed to be normally seven years, which is the same assumption made in the memorandum. The construction of the first and second reactors is expected to begin in year 1 and year 3, respectively, while construction of the third and fourth reactors is expected to begin in year 8 and year 10, respectively, once the first and second reactors have been completed. The Government makes the same assumption as was made in the memorandum regarding the construction period but deviates from the assumption that all four reactors will start to be instructed within a seven-year period. The construction of a nuclear power plant requires a lot of resources in the form of specialised labour and materials for example, and places high demands on the value chains for these. Furthermore, a stepwise construction of the new nuclear power plants may be preferable in order to adapt the expansion of electricity generation to the expected rate of growth in electricity consumption. Therefore, the Government assesses that it is reasonable to assume no more than two large-scale reactors being constructed in parallel. In the scenario where investments in the reactors are expected to be impacted by cost overruns and delays, the investment phase is assumed to be ten years per reactor. Even in this scenario, it is assumed that a maximum of two reactors will be built simultaneously. This means that the third and fourth reactors will start being constructed later if the first two reactors are delayed.

Assumption that expenditure and revenue are financed in the central government budget

In relation to the fiscal policy framework, in its consultation response *LO* contends that central government should manage the investments in nuclear power, just as the Riksdag has handled military aid to Ukraine. *ESV* calls for an analysis of the impact of the investments on the fiscal policy targets. *Seko* would like to see a clarification of how investments should be addressed in relation to the fiscal policy framework. *KTH, Chalmers* and *SKR* contend that the investments may supplant other public investment and welfare financing.

The Government notes that all revenue, expenditure and borrowings reported as general government in the national accounts affect the fiscal policy target variables and should be addressed in accordance with the fiscal policy framework. The Government intends to report the general government expenditure linked to nuclear power investments in the budget bills affected by the investments. In the budget bills, the Government also presents its assessment of whether net lending and the general government consolidated gross debt are in line with the budgetary policy objectives of the fiscal policy framework. In this Bill, it is assumed that the target for general government net lending is achieved each year by adjusting central government's other revenue and expenditure to completely neutralise the impact of the investments in nuclear power on net lending. Thus, it is assumed that the level of general government net lending is the same as it would have been without the investments in nuclear power and associated state aid. This means that the level of general government consolidated gross debt, also known as Maastricht debt, is not affected in the main

scenario nor the cost increase scenario in this section, since disbursements and repayments are recorded as general government expenditure and revenue, respectively. For these scenarios, the direct impact of the investments on net lending is presented in Sections 8.6.3 and 8.6.4 in isolation from the adjustment of other revenue and expenditure that is assumed to result in net lending remaining unchanged.

8.6.2 The effects depend on the statistical recording

General government finances are recorded statistically in the national accounts in compliance with an international regulatory framework. In Sweden, these statistics are compiled by Statistics Sweden (SCB). Eurostat, the statistics agency of the European Commission, reviews the statistics compiled in compliance with the international framework. Eurostat also has the final preferential right of interpretation and may review Statistics Sweden's reporting. Investments with state aid are occurring in many of the EU Member States and Eurostat has indicated that the agency will conduct an inquiry into and publish guidelines on how such investments should be recorded in the national accounts.

After discussions with Eurostat and Statistics Sweden, where different potential accounting methods have been discussed, in this section the Government assesses how the proposed aid model is likely to be recorded. These talks took place before Eurostat has inquired into and published guidelines for the recording of investments in nuclear power. Besides the fact that such specific guidelines do not yet exist, Eurostat will not either be able to make a final assessment of the recording before the design of the aid has been established in contract between central government and a project company. The Government notes that it is uncertain how investments in new nuclear power with state aid in the form of loans and CfDs will be recorded in the national accounts.

The Government assesses that it is most likely that the disbursements of the loans will be classified as general government expenditure and that the repayments of the loans will be classified as revenue. In this case, the loans are not recorded as loans in the national accounts, but as, for example, repayable investment grants or the like. Lending through loans in the Swedish National Debt Office is normally recorded as receivables in the national accounts and does not affect net lending. The reason why the loans should not be recorded in the way that loans are usually recorded is deemed to be the extensive involvement of general government in the investments and their financing. This accounting means that disbursements and repayments of central government loans does have an impact on general government net lending. The main scenario for the effects on general government finances in this section is based on this kind of reporting of statistics. The fact that this is described as the main scenario is partly due to the Government's assessment that this accounting is more likely than other accounting methods, and partly due to a precautionary principle because the effect on net lending would be very small if the central government loans were instead recorded in the way that loans are usually recorded in the national accounts.

8.6.3 Main scenario – loans are classified as general government expenditure

In the main scenario for the effects on general government finances in figure 8.1 it is assumed that the disbursements and repayments of the central government loans are recorded as general government expenditure and revenue, respectively. Since the disbursements of the loans are recorded as a central government expenditure in the national accounts, general government net lending is negatively affected during the investment phase. When a reactor starts commercial operation, the loan disbursements and their negative impact on net lending cease. Once the reactor is in commercial operation, it is estimated to generate some financial surplus for the company and thus central government tax revenue that has a small positive impact on general government net lending. The repayments of the loans then have a significant positive impact on net lending.

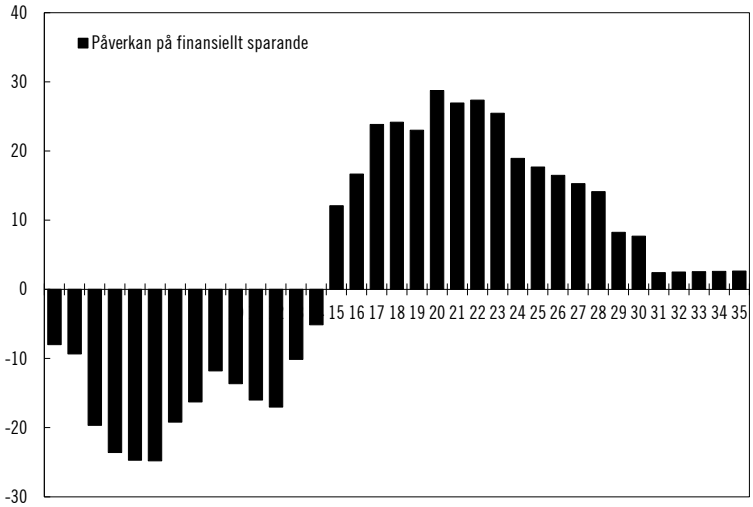
Since in this scenario the Government assumes that the loans are not recorded as loans in the national accounts, it is assumed that the accrued interest is not either recorded as central government income from interest during the investment phase. When the reactor begins commercial operation and it is assumed that the project company starts paying interest to central government, it is assessed that a corresponding income is recorded in the national accounts. The Government considers that the interest rate on the central government loans should be stepped up during the operational phase in order to give the project company incentives to replace the central government loans with private loans. This is expected to result in central government income from interest increasing for a period of time, and in the repayment of loans to central government during a period when the central government lending rate increases to a level that exceeds the market rate.

In this scenario, construction of the first reactor is assumed to begin in year 1 and the fourth reactor is expected to be completed in year 16. The positive impact of the investments on net lending from year 15 is due to the fact that general government revenue is strengthened in that year by the repayment of the loans starting for the second reactor, and that expenditure is reduced when the third reactor is completed. As of year 31, it is assumed that the repayments of central government loans for all four reactors will have been completed, reducing the impact on general government net lending.

Since it is assumed that central government neutralises the impact of investments in nuclear power on net lending through central government's other revenue and expenditure, the level of general government net lending will be the same as it would have been without these investments. Therefore in this scenario, no impact on the level of general government consolidated gross debt arises.

Figure 8.1 Impact on general government net lending when the loans are classified as general government expenditure, no cost increase

SEK billion, fixed prices, 2025 prices



Source: Own calculations.

The constellation of owners of a project company that is going to invest in nuclear power plants can vary. It is possible for central government to acquire a portion of the shares in the project company after approval by the Riksdag. The Government assesses it to be probable that central government's eventual acquisitions of shares would be recorded without any impact on net lending in the national accounts, provided that ownership of the shares is on terms and conditions comparable to those of other owners. On the other hand, the acquisition of shares would increase general government consolidated gross debt by the corresponding amount. With the other assumptions in this scenario, a 20% state ownership for example would mean an increase in the general government consolidated gross debt of around SEK 21 billion. This would entail a comparatively slight weakening of net lending by increasing central government interest expenditure. The Government assesses that a state part-ownership in the project companies would have some strengthening impact on net lending in the long term, as the operation of the nuclear power plant is assumed to generate a financial surplus that is distributed to the owners. In the impact assessment calculations, the project companies are assumed to generate and distribute around SEK 9 billion per year. This means that general government net lending is expected to strengthen by around SEK 0.1 billion per percentage point of state part-ownership. For example, it is estimated that net lending will be strengthened by on average around SEK 1.8 billion per year if the state holds 20% of the shares.

8.6.4 Alternative scenario – cost increase and delays

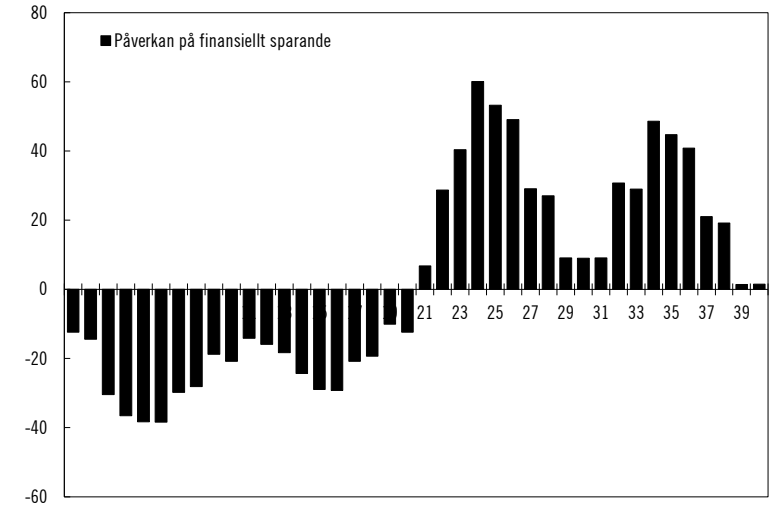
A scenario is presented in figure 8.2 where the construction of the four reactors suffers delays and 100% cost overruns. In this scenario, the investment phase for each reactor is assumed to last for 10 years instead of 7 years. The cost per reactor is assumed to amount to SEK 206 billion instead of the other scenarios' cost of SEK 103 billion. As in the other scenarios, construction of the third and fourth reactors is assumed to begin once the first and second reactors are completed. This means that construction of the third and fourth reactors will begin in year 11 and year 13, respectively; and that year 23 will be the first year when all reactors have been completed. Both the negative effect on general government net lending during the investment phase and the positive effect on net lending when the loans are repaid are greater in this scenario, as the higher construction cost means higher central government loans than in the main scenario. When the total loan amount is twice as large in the event of a 100% cost overrun, it does not mean that the annual general government expenditure will be twice as large as in the main scenario, because the investment phase is extended. When the construction costs are higher than expected, it means an assumption that risk sharing will be activated at the beginning of the operational phase. This means that the central government lending rate will be reduced, which has a weakening effect on general government net lending during the years when risk sharing is activated. The total impact on net lending from year 1 to year 38, when it is assumed that the loans will have been repaid, is estimated to be a strengthening of SEK 95 billion.

This scenario can also illustrate the approximate effects of planned construction costs being higher and construction periods longer, without cost overruns and delays, than assumed in the main scenario. If the construction costs are expected to be twice as much as in the main scenario and do not increase to that expectation, risk sharing is not deemed to be activated, unlike in a cost increase scenario. An expected higher construction cost therefore entails somewhat higher central government interest income and a somewhat more positive impact on net lending than is shown in figure 8.2.

As in the main scenario, it is assumed that the level of general government net lending and the general government consolidated gross debt will not be affected, as the effect of the investments on net lending is neutralised by adjusting other central government revenue and expenditure.

Figure 8.2 Impact on general government net lending when the loans are classified as general government expenditure, 100% cost increase

SEK billion, fixed prices, 2025 prices



Source: Own calculations.

8.6.5 Alternative scenario – loans are not classified as general government expenditure

In a scenario where the central government loans are recorded as usual in the national accounts, the disbursements and repayments would not be counted as general government expenditure or revenue, respectively. Beyond the interest, the loans would have no impact on general government net lending. The loans are recorded as a central government receivable on the project company. Besides the assumption in the national accounts, the other assumptions in the scenario are identical to those made in the main scenario. In this scenario, the impact of investments in nuclear power on net lending is assumed to consist solely of general government revenue from taxation and positive net interest revenue when the reactors are operating. In this case, the impact on net lending is deemed to be primarily positive but of a significantly smaller order of magnitude than in the other scenarios. The effect on net lending is assumed to be zero during the investment phase, while it is expected to strengthen net lending by SEK 2–4 billion when the reactors are operating.

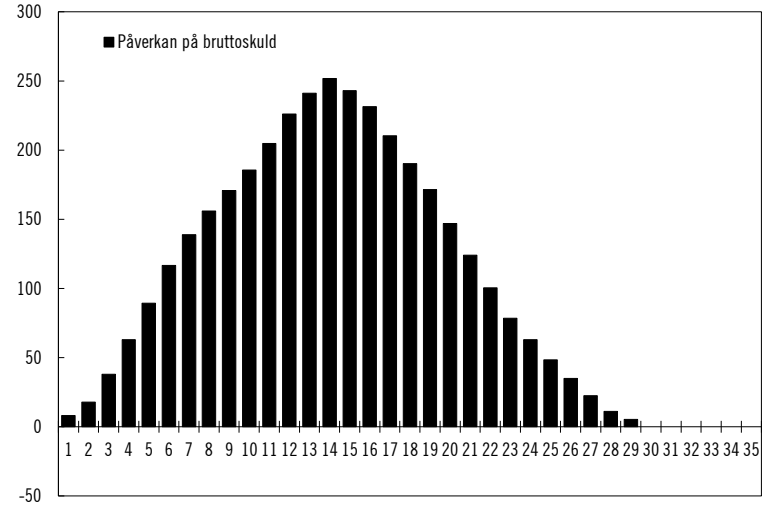
In this scenario, when the central government loan transactions do not affect general government net lending, neither do they entail any adjustment of other central government revenue and expenditure. Unlike in the previous scenarios, in this case the central government loans are therefore assumed to affect central government debt, as central government increases its borrowings to finance lending to the project companies. This also affects the general government consolidated gross debt. The estimated impact on general government consolidated gross debt is shown in figure 8.3. The effect corresponds to how central government

loans to project companies are assumed to develop in the main scenario. At most, the impact of the debt is estimated to amount to around SEK 252 billion in year 14, after which it will decrease as the project companies amortise their central government loans. In the long term, once the central government loans have been repaid, the investments are no longer expected to have an impact on the level of general government debt.

In November 2024, a parliamentary inquiry submitted its report *Från överskottsmål till balansmål* (SOU 2024:76) (From surplus target to balance target). The report proposes that a balance target be introduced for general government net lending in 2027, and that the benchmark for the debt anchor should remain at 35% of GDP +/-5 percentage points. The report also states that the balance target is expected to result in general government consolidated gross debt amounting to approximately 35.5% of GDP in 2035. Excluding the impact on debt impact of investments in nuclear power, this is assumed to be the level of the general government consolidated gross debt in 2035. As mentioned above, the impact on the general government consolidated gross debt of loans to four reactors is estimated to be at most SEK 252 billion, provided that the loan disbursements are not recorded as expenditure in the national accounts, and without any cost increases. Like other amounts, this figure is calculated at 2025 prices. The fiscal policy targets are evaluated at current prices. For a rough estimate of the impact on general government consolidated gross debt at current prices in relation to the year's actual GDP at current prices, the amount at 2025 prices is illustrated here in relation to the projected GDP level for 2025. Thus, the impact on general government consolidated gross debt is estimated to be at most 3.8% of GDP for 2025. This means that in this scenario, the general government consolidated gross debt could be temporarily close to the upper limit of the debt anchor, given that the general government consolidated gross debt without nuclear investment is assumed to be 35.5% of GDP. As can be seen in figure 8.3, the impact on general government consolidated gross debt is expected to decrease rapidly again. Higher capital costs or a higher share of loan financing would entail higher central government lending. This would mean that the debt anchor would be temporarily exceeded, given the assumed level of the general government consolidated gross debt in 2035.

Figure 8.3 General government consolidated gross debt when the loans are not classified as general government expenditure

SEK billion, fixed prices, 2025 price level



Source: Own calculations.

8.6.6 Potential credit losses

In its consultation response, the *Swedish National Debt Office* contends that the effect of actual credit losses linked to the central government loans should have been stated in the impact assessment. According to the National Debt Office, a certain credit risk should be assumed to exist even if it is limited by the CfDs as well as the risk- and earnings-sharing mechanism.

The Government assesses that the credit risk, in particular before the conditions for the specific project and the loan terms are known, is difficult to appraise. This means that estimates of expected losses on the loans are subject to considerable uncertainty. Therefore, it may be reasonable to update the estimates as the project progresses, as the National Debt Office proposes.

The fact that the loan disbursements are counted in full as expenditure, in the main scenario as well as in the cost increase scenario, means that expected credit losses have no impact on net lending when the loans are disbursed. On the other hand, the positive effect on net lending when the loans are repaid would be limited by actual credit losses. The Government shares the National Debt Office's view that a credit risk can be assumed to exist even if it is limited by the fact that the CfD and the risk- and earnings-sharing mechanism strengthen the borrower's capacity to repay the loan. In the main scenario and the cost increase scenario, credit losses would have no effect on general government net lending until a couple of decades later. Therefore, the credit loss is assumed to be zero in the accounting of the effects on public finances in Figures 8.1–8.3.

However, to illustrate the effect of actual credit losses on public finances, it can be said that credit losses of 5% of the borrowed amount in

the main scenario would correspond to SEK 16 billion. This would mean, for example, that the strengthening of net lending during the operational phase would decrease correspondingly. In view of the great uncertainties described above, this should be seen as calculation example and not the Government's assessment of expected credit losses.

8.6.7 Compensation resulting from CfDs

According to the proposal in this Bill, CfDs will be signed between central government and the project companies. If the market price for electricity is lower than the strike price in the CfDs, central government must pay compensation to the project companies. However, if the market price for electricity is higher than the strike price, the project companies must pay compensation to central government. The amount of the compensation is proportionate to the difference between the electricity price and the strike price. The Government considers that expenses and revenues should be allocated based on the benefits that arise. In this impact assessment, the Government assumes that the compensation is financed in the central government budget and thus does not have any impact on net lending.

In table 8.2 below, the amounts of compensation for four reactors with installed generator capacity of a total of 5 000 MWe and a reference capacity of 89% are shown. Like the calculations presented in the memorandum, the strike price in the CfD is assumed to be 80 öre per kWh. However, the future strike prices in the CfDs are unknown and will be based on the future conditions for the specific projects.

In its consultation response, the *Swedish Society for Nature Conservation* reasons that the compensation could be greater because, where industrial establishments fail to materialise for example, it would result in a lower electricity price than assumed in the EP scenario, and that the electricity price in the FM scenario, which is lower, would be a reasonable starting point. The Government notes that Svenska kraftnät's assumption concerning future electricity consumption in the FM scenario is below the Government's planning target. In order to illustrate how large the compensation for the CfDs can be at different electricity prices, the FM scenario is nevertheless used in addition to the EP scenario in table 8.2. Since Svenska kraftnät reports electricity prices at 2020 prices, they have been converted into 2025 prices using the Government's CPI forecast. In the FM scenario, an electricity price equivalent to 61 öre per kWh is assumed in 2045. In such a scenario, it is estimated that central government will compensate the project companies in the amount of SEK 7.5 billion annually. In the EP scenario, however, it is assumed that the electricity price will be the equivalent of 83 öre. In that case, the estimate is that the project companies will compensate central government in the amount of SEK 1.4 billion annually. The higher electricity price in the EP scenario is due to Svenska kraftnät having assumed a higher electricity consumption as a result of Swedish industry's switch to electric drive along with the establishment of new electricity-intensive industries. The uncertainty about both future electricity prices and the strike price in the CfDs means that it is difficult to estimate the amount of the compensation. It is also uncertain whether it will be

primarily central government providing compensation to the project companies or whether the companies will instead compensate central government. Variations in the price of electricity mean that the amount of compensation, and whether it is an expense or revenue for central government, may vary from year to year. The compensation would be greater than set out in the table if electricity prices were lower than in the FM and EP scenarios, or if the strike price were higher. However, the expected energy transition, with a sharp increase in demand for electricity, does not suggest very low electricity prices. The amounts reported in table 8.2 should be seen as calculation examples that illustrate how various differences between electricity prices and strike prices affect the amount of compensation, and whether it will be an expense or revenue for central government.

Table 8.2 Calculation example for annual compensation for CfDs

Fixed prices, 2025 price level

Scenario	Electricity price	Difference from assumed strike price	Central government's compensation to project companies
	Öre	Öre	SEK billion
FM	61	19	7.5
EP	83	-3	-1.4

Note: In its LMA, Svenska kraftnät reported assumed electricity prices at the 2020 price level. Here they have been uprated to the 2025 price level using the Government's CPI forecast.

Source: Own calculations.

8.6.8 Utilisation of central government's fiscal space

It is clear in figure 8.1 that the investments are expected to reduce net lending, and thus the scope for other reforms in years 1–14 is also expected to decrease in the main scenario. However, from year 15 onwards, and particularly in the period years 15–30, the scope for other reforms is expected to increase as a result of the investments. To clarify the extent of these effects on the fiscal space, they can be related to the size of a normal fiscal space. The comparison in this section is made in two ways to reflect annual effects on the fiscal space, as well as cumulative effects over multiple years.

The investments' utilisation of one year's fiscal space

Because general government tax revenues tend to increase in line with GDP, while general government expenditure usually increases at a slower rate, normally an annual fiscal space arises, as described in the report *From surplus target to balance target*. This occurs in the absence of active decisions on unfunded changes in, for example, public sector expenditure or tax and transfer systems. The report states that the fiscal space created by automatic budgetary strengthening is normally in the order of 0.3–0.5% of GDP. Depending on the economic situation among other things, what is deemed to be an appropriate fiscal space may be larger or smaller

than this for stabilisation policy reasons. A normal fiscal space for unfunded reforms is assumed here to be the midpoint of the range, i.e. 0.4% of GDP, which corresponds to SEK 27 billion (based on the Government's forecast for GDP in 2025).

The impact of the investments on central government's annual fiscal space is calculated as the annual change in the effect on net lending. The impact on the annual fiscal space is estimated to vary from year to year. For the 16 years taken to build the four reactors in the main scenario, the annual fiscal space is assumed to be negatively affected for 8 years, positively for 7 years and be neutral for 1 year. The negative effect on the fiscal space in a single year is estimated to vary between SEK 1 billion and SEK 10 billion, which corresponds to between 4% and 40% of the fiscal space normally created by the automatic budget strengthening measure. Even in the cost increase scenario, the effect on the annual fiscal space is expected to be positive for roughly the same number of years as it is negative during the period during which the reactors will be built. In the case of the cost increase scenario, the negative effect in an individual year is estimated to vary between SEK 2 and SEK 16 billion, which corresponds to between 7% and 60% of the fiscal space normally created by the automatic budget strengthening measure.

The investments' utilisation of a period's fiscal space

Another way of relating the investments' cost in general government finances to the fiscal space is to look at the cumulative effect over a multi-year period. It is clear in figure 8.1 that net lending is expected to be negatively affected in years 1–14 in the main scenario. If the weakening of net lending accumulates during that period, the amount will be SEK 219 billion, which is assumed to have a temporary inhibitory effect on other reforms. This represents 8% of the total fiscal space that normally accumulates over 14 years. In years 15–30 however, general government net lending is expected to be strengthened by repayments of the loans and revenue from interest and taxes. If the strengthening of net lending accumulates during the entire period, the amount will be SEK 307 billion, which can finance other incidental reforms. In total, during the entire period from the beginning of the disbursements of loans in year 1 to when it is assumed they have been fully repaid in year 30, the impact on general government net lending adds up to SEK 88 billion, which can temporarily finance other reforms. In the scenario of doubled capital costs, the impact on net lending is negative in years 1–20, to an accumulated amount of SEK 461 billion. This represents around 8% of the total fiscal space that normally accumulates over 14 years. The cumulative strengthening of net lending is estimated to be SEK 556 billion in years 21–38, when the central government loans are repaid in this scenario. This represents around 12% of the fiscal space that normally accumulates of automatic budgetary strengthening measures over such a long period.

The Government's examination of applications for state aid for investments in new nuclear reactors will need to involve several government agencies. The Government Offices will be responsible for the preparation of an application, including negotiations with the companies on contracts and the state aid investigation. The examination of the aid application therefore primarily has an impact on the Government Offices. In the preparation, documentation and opinions need to be obtained from the relevant government agencies. In its consultation response, *Svenska kraftnät* emphasises the great importance of new nuclear power being located with regard to the needs of the electricity system and the expansion of the associated transmission network, and argues that Svenska kraftnät should be involved in matters of location. The Government agrees with this. The Swedish Radiation Safety Authority (SSM) is responsible for the preparation of applications for licences under the Nuclear Activities Act and, according to the proposal, an application for such a licence must have been received before the Government can decide to grant financial support. Accordingly, SSM will be consulted in an appropriate manner before decisions to grant aid are made. The *National Debt Office* considers that its tasks in connection with issuing and managing loans to the company found to be eligible for aid should be clearly specified by the Government and that, to the extent tasks are delegated to the National Debt Office, they do not include negotiations on contractual terms and conditions that emanate from trade-offs between different policy objectives. However, the National Debt Office does see the Debt Office being able to assist the Government in the further preparation, including these negotiations. Furthermore, the National Debt Office emphasises that it is of great importance that the increased borrowing needed for such lending happens within the framework of the current borrowing strategy. The Government assesses that the National Debt Office may need to assist the Government Offices in the design of the loan agreements and estimates of central government's financing costs for the loans. Regarding the Debt Office's views on borrowing, the introduction of the financing and risk-sharing model does not entail any change to the current regime whereby central government debt is to be managed in order to minimise the cost of management in the long term, taking into account risk.

The *Swedish Association of Municipalities with Nuclear Facilities* (KSO) would like see an account in the memorandum of the effect on municipalities in terms of, among other things, local insight, acceptance (veto), citizen dialogue, skills, planning for nuclear accidents and subsequent cleanup, checks of drinking water, waste management, infrastructure, safety and planning of their own vital functions in the community. KSO considers therefore that the economic consequences in total need to be further investigated, and the municipalities concerned need to be compensated by central government for both nuclear waste and storage in a waste repository, as well as for the establishment of new nuclear power. The Government considers that the views from KSO relate to the consequences of the licence application processes and not to the introduction of state aid for investments in new nuclear power. A licence to construct new nuclear reactors also requires preparation by the Land and

 Environmental Courts, but these are not considered to be affected by the preparation of state aid.

9 Enactment comments

Proposed Act on state aid for investments in new nuclear power

Introduction

Section 1 This Act contains provisions on state aid to companies for investments in new nuclear reactors in Sweden.

The paragraph describes the content of the Act. The considerations are set out in Section 5.3.

A company means a limited company or equivalent European company forms where ownership is divided into shares. Investments refer to measures and operations in accordance with Sections 3 and 4. The provision states that under the Act, aid can only be granted for reactors built within Sweden's borders.

Loans and CfDs

Section 2 Aid may be granted in the form of central government loans and two-way CfDs.

The aid is designed to incentivise efficient resource utilisation in the construction, possession and operation of new nuclear reactors. The aid is also designed to ensure a judicious allocation of risks and earnings between central government and the beneficiary company.

This Section regulates the form in which the state aid may be granted as well as certain basic principles for the design of the aid. The considerations are set out in Section 5.1.

The *first paragraph* states that aid may be granted in the form of central government loans and through two-way CfDs. The aid thus comprises both loans and two-way CfDs. 'Central government loans' means central government lending financed by loans in the National Debt Office and issued to the beneficiary companies. 'Two-way contract for difference' (CfD) means contracts for difference as defined in Article 2 of Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market in electricity (Electricity Market Design Regulation). According to the definition in the Article, it means a contract between a power-generating facility operator and a counterpart, usually a public entity, which provides both minimum remuneration protection and a limit to excess remuneration. The two-way CfDs described in the provision are concluded between central government and a company that generates electricity from new nuclear power.

The *second paragraph* sets out certain basic principles that central government must adhere to when designing the loan agreements and the two-way CfDs, respectively. It therefore states that the aid is designed to incentivise efficient resource utilisation in the construction, possession and

operation of new nuclear reactors; and that the aid is designed to ensure a judicious allocation of risks and earnings between central government and the beneficiary company. This means, among other things, that aid is designed to build in incentives for the beneficiary company to construct and operate the new nuclear reactors efficiently. Furthermore, the aid is designed so that the risks and earnings are allocated between central government and the company in a way that gives the company the necessary conditions to invest without central government taking excessive risks; and that earnings are shared between the company and central government in a fair way. The provision therefore implies that these principles must be reflected in the terms and conditions in the loan agreements and CfDs following a decision to grant aid, but that these may be determined in light of the circumstances in the individual case and may therefore differ on a case-by-case basis.

Section 3 Central government loans may be granted for the construction and test operation of new nuclear reactors, and for project planning and other preparatory measures for their construction.

This Section specifies the purposes for which central government loans may be granted. The considerations are set out in Section 5.1.1.

It is evident from the Section that loans may be issued for nuclear reactors that are new. The term ‘construction’ has the same meaning as in the Nuclear Activities Act (1984:3) and refers to the actual building of the reactor. ‘Test operation’ refers to the phase in the establishment of a new nuclear reactor when the reactor is loaded with nuclear fuel and is test-run before the reactor has received all the necessary licences from the Swedish Radiation Safety Authority to operate at its full capacity (see Govt Bill 1983/84:60 pp. 194–196). ‘Planning and other preparatory measures’ mean the measures required before the construction of a new nuclear reactor can begin. These may include site preparation measures such as blasting and excavation works, electric wiring, establishment of the necessary infrastructure on the site for the construction, and logistics and transport for these measures. They may also include investigation and preparatory works for the construction of the reactor, such as detailed design and adaptations of the selected reactor model, as well as planning and logistics for the construction of the reactor.

Section 4 Two-way CfDs may be entered into for the commercial operation of new nuclear reactors.

The Section specifies the purpose for which two-way CfDs may be entered into. The considerations are set out in Section 5.1.2.

It is evident from the Section that two-way CfDs may cover the commercial operation of nuclear reactors and that it is a requirement that the reactors should be new. ‘Commercial operation’ means the phase after the nuclear reactor has received approval from the Swedish Radiation Safety Authority to operate at full capacity. This happens after the end of the test operation phase (Govt Bill 1983/84:60 pp. 195–196).

Section 5 The aid is subject to terms and conditions regulated in contract between the central government and the beneficiary company.

These terms and conditions must take into account:

1. central government's risk;
2. central government's ability to assert its rights; and
3. central government's needs for control and monitoring.

The Section specifies that the aid granted under the Act is subject to terms and conditions, how the terms and conditions are regulated, and the general principles according to which the terms and conditions are formulated. The considerations are set out in Section 5.1.

The *first paragraph* states that the terms and conditions for the aid are regulated in contract between central government and the beneficiary company. The provision is based on the circumstance that aid under the Act will be provided by central government issuing loans to, and entering into two-way CfDs with, beneficiary companies. The terms and conditions of the loans and the two-way CfDs, as well as the risk- and earnings-sharing mechanism that will be introduced through them, are regulated in private law contracts between central government and the beneficiary company. The term 'contract' means an agreement in writing.

The *second paragraph* sets out certain basic principles that central government must always adhere to when designing the contractual terms and conditions. Central government's risk in a project for investing in new nuclear power must be identified and reflected in the contracts. Furthermore, central government's ability to assert its rights is regulated in the contractual terms and conditions, such as the question of when, under the contracts, central government can recover aid paid to the company if the company commits a breach of contract. Finally, the contracts must include mechanisms for control and monitoring, for example, how the funds paid have been used by the company. The list is not exhaustive. In addition, the design of the aid, which is expressed in the terms and conditions in the contracts, can take into account a number of other interests, such as the needs of the electricity system and the electrification of society, and avoiding security policy risks arising.

Conditions for aid

Section 6 Following an application to this effect, the Government may decide to grant aid to a company for the purposes referred to in Sections 3 and 4.

Aid may only be granted if the new nuclear reactors within the meaning of Sections 3 and 4 are located in the same place in Sweden and have a total installed generator capacity of at least 300 MWe. If there are special reasons, the Government may decide to grant aid even if the reactors have a total installed generator capacity of less than 300 MWe.

The Section regulates some of the most central conditions for the aid under the Act. The considerations are set out in Section 5.4.1.

Firstly, the *first paragraph* states that it is the Government that makes the decision to grant aid under the Act.

Secondly, it states that aid is granted to a company.

Thirdly, it state that a decision to grant aid is made following an application for aid.

Fourthly, it states that aid may only be granted for the purposes set out in Sections 3 and 4. The references to these sections also indicate that the investments must relate to new nuclear reactors. This could mean one new reactor or several new reactors. Thus, aid may not be granted for measures relating to or the operation of existing nuclear reactors, such as expansion, repair, operation and maintenance and the like.

The *second paragraph* states that aid may only be granted if the new nuclear reactors within the meaning of Sections 3 and 4 are located in the same geographical location within Sweden's borders, and have a total installed generator capacity of at least 300 MWe. This means that, as a general rule, the new nuclear reactor or reactors for which the investments are intended should have a total installed generator capacity of at least 300 MWe at a location in Sweden. The same geographical location means that the reactors must be located at one and the same real property unit, or be located at several neighbouring real property units, and constitute one and the same power plant. The second paragraph also states that the Government may decide to grant aid for investments even if the reactors have a total installed generator capacity of less than 300 MWe if there are special reasons. Such special reasons may be that a project is deemed to make a significant contribution to the energy system meeting the needs discussed in Section 4.1, i.e. that Sweden will achieve the climate and energy policy objectives, that future demand for electricity including the connection of new industry is met, that continuity of supply in the electricity system is improved and the transmission capacity in the transmission network increases, that price differences between the Swedish bidding zones are reduced, and that electricity prices for electricity customers are competitive. At the same time, the justifications set out in Section 4.2 for the introduction of this state aid should be assessed as applicable to the project in question, i.e. that the aid is necessary for the project to get off the ground despite design risks, market risks, and policy and regulatory risks.

Section 7 Aid may only be granted to a company whose exclusive or virtually exclusive purpose is the construction, possession and operation of the new nuclear reactor or reactors to which the decision to grant aid relates.

The Section specifies to which companies the aid may be granted. The considerations are set out in Section 5.4.3.

It is evident from the Section that aid may be granted only if the company's exclusive or virtually exclusive purpose is to construct, possess and operate the new nuclear reactor or reactors to which the aid relates. This means that the operations to which the aid relates are pursued separately in a company for this purpose. For example, the company may not own and operate nuclear reactors other than the new reactors to which the aid relates. At the time of the Government's decision to grant aid, the company does not need to have to be currently pursuing actual operations for the construction, possession and operation of these new nuclear reactors. As a rule, this will only happen after the company has received state aid under this Act. However, both at the time of the decision to grant aid and during the period that the company utilises the aid, the company's exclusive or virtually exclusive purpose must be the construction,

possession and operation of the new nuclear reactors to which the Government's decision to grant aid relates. Construction, possession and operation have the same meanings as in the Nuclear Activities Act (1984:3) That the company's exclusive or virtually exclusive purpose is the construction, possession and operation of the new nuclear reactor(s) to which the decision to grant aid relates does not prevent the company from pursuing related activities which, in the normal course of operations for the construction, possession and operation of new nuclear reactor(s), are necessary for the realisation of the project to which the aid relates. For example, the company may need to import and handle nuclear fuel, carry out civil engineering works at the site where the reactor is to be built, or logistics and similar activities required for a project of the scope currently in question to become a reality.

Section 8 Aid may be granted only when CfDs within the meaning of Section 5 are entered into.

The Section specifies when the decision to grant aid may be announced. The considerations are set out in Section 5.4.2. The contracts referred to are the contracts to be concluded between central government and the beneficiary company, which are loan agreements and two-way CfDs. The provision prevents the Government from making decisions to grant aid before such agreements/CfDs have been negotiated and are in principle ready for signature. For example, a government decision on aid can be made in close connection with the contracts being signed. Practical considerations may determine when the contracts are to be signed in relation to the Government's decision to grant aid.

Section 9 Aid may be granted only after a company has applied for the licences required under the Nuclear Activities Act (1984:3) and the Swedish Environmental Code for the construction, possession and operation of the new nuclear reactor or reactors to which the decision to grant aid relates.

It follows from this Section that decisions to grant aid may only be made after a company has applied for the licences required for the activity. The considerations are set out in Section 5.4.4.

The provision means that the company must have applied for a licence in accordance with the Nuclear Activities Act (1984:3) and the Environmental Code for the construction, possession and operation of the new nuclear reactor or reactors to which the decision to grant aid relates before the decision may be announced. However, this does not prevent the company from applying to the Government for aid and that the drafting of the application begins pending the submission of the license applications, with their supporting documentation.

Section 10 Aid may only be granted to a company if:

1. Persons who have a qualifying holding in the company are suitable to exert a significant influence over the management of the company; and
2. Persons who are part of the company's management are suitable for such a task.

Qualifying holding means here the same as in Chapter 1, Section 5, point 15 of the Banking and Finance Business Act (2004:297).

The Section regulates the requirements imposed by the Act on certain owners and representatives of the beneficiary company. The considerations are set out in Section 5.4.5.

Point 1 in the *first paragraph* states that persons who have a qualifying holding in the company must be deemed suitable to exert a significant influence over the management of the company. Where an owner is a legal person, the probity check is to cover representatives of the legal person. The probity check should check the suitability of the owners to wield a significant influence over the management of the company. This means, among other things, that the owner or owners must be assessed as being honest and upright persons of integrity, and have the economic capacity necessary, for example, to utilise the granted licence to construct and pursue the project to completion. This probity check may take into account the size of each shareholding and the influence exerted.

Point 2 specifies that a person who is part of the management of the company must be considered suitable for such a task, i.e. to be part of the management of the company. The management of the company refers here to the directors on the Board of Directors and their alternates, the Managing Director or CEO and the Deputy CEO. The probity check should ensure that the persons who are members of the management are deemed suitable to hold positions in the management of the company. This means, among other things, that they are honest and upright persons of integrity, and possess experience that is relevant to the task.

In assessing the suitability of the owners and management, particular attention should be paid to whether they have failed to fulfil their obligations in their business activities or other financial affairs to a significant degree, or committed a serious offence such as being convicted of tax offences, economic crime, or crime targeting Sweden's national security, or have been subject to bankruptcy proceedings (cf. Govt Bill 2008/09:155 p. 87).

The *second paragraph* specifies what is meant by qualifying holding in the first point of the first paragraph. Qualifying holding means the same as in Chapter 1, Section 5 of the Banking and Finance Business Act (2004:297), i.e. direct or indirect ownership of a company if the holding, calculated in the manner set out in Chapter 1, Section 5a of the same Act, represents 10% or more of the equity or of all votes or otherwise makes possible a significant influence on the management of the company.

Right to issue regulations

Section 11 Pursuant to Chapter 8, Section 7 of the Instrument of Government of Sweden, the Government may issue additional regulations governing aid under this Act.

The Section contains an information provision that the Government may issue additional regulations governing state aid for financing new nuclear power exercising its residual powers pursuant to Chapter 8, Article 7 of the Instrument of Government. The considerations are set out in Section 5.5.

The provision means that the Government may issue regulations governing, for example, the terms and conditions for aid and the information that an application for aid must contain. Such information may include planned installed generator capacity, location, reactor type, estimated costs, and operational life. Regulations may also be issued to more precisely define the terms contained in the Act on State Aid for the Financing of New Nuclear Power. The list is not exhaustive.

Effective date provision

This Act will enter into force on 1 August 2025.

This provision specifies when the Act will enter into force. The considerations are set out in Section 5.6.

The provision states that the Act will enter into force on 1 August 2025.