



**Policy history
safeguarding policy
[Waarborgingsbeleid]**
Summary

Antea Group

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1. Introduction

In the future energy infrastructure for the Netherlands, the government has identified a key role for nuclear energy. Since the end of the nineteen seventies, the Dutch government has been working to draw up a policy regarding the locations where it should be possible to establish new nuclear power plants. This policy is known as the safeguarding policy.

In the safeguarding policy for 2024¹, two locations have been designated as potential establishment locations for the construction of new nuclear power plants. These are Borsele/Vlissingen (Sloegebied area) and Maasvlakte I, see Figure 1.

This safeguarding policy includes a description stating that no developments may take place that render impossible or seriously impair the possible construction of nuclear power plants at the establishment locations. In that framework, requirements are, among other things, imposed on the construction of homes in a radius of 1 kilometre around these establishment locations. The safeguarding policy does not regulate the reservation of specific locations in these establishment locations for nuclear power plants.



Figure 1 Current safeguarding locations (source: draft PEH).

¹ At present the safeguarding policy is being updated. This updating is described in the National Energy Network Programme (PEH). The most important change is that the Eemshaven location has been dropped as an establishment location for new nuclear power plants. The legal framework (Environmental Quality Decree) is expected to be adapted accordingly in the spring of 2024.

2. Establishment of a safeguarding policy [Waarborgingsbeleid]

2.1 Summary

Since the end of the nineteen seventies, in a series of steps, a total of thirty locations have been reduced to the current two locations as laid down in the safeguarding policy. The process started in 1975 with the first National Structure Plan for Electricity Supply (SEV). In this plan, potential locations were selected for large-scale energy generation. At this point, no distinction was made between locations for nuclear energy and other energy carriers. Subsequently, via a series of steps in 1986, 2008 and 2023/2024, various locations were dropped, resulting in the current two safeguarding locations.

In brief, this history is reproduced in Figure 2. The subsequent sections describe the process in more detail, for each period.

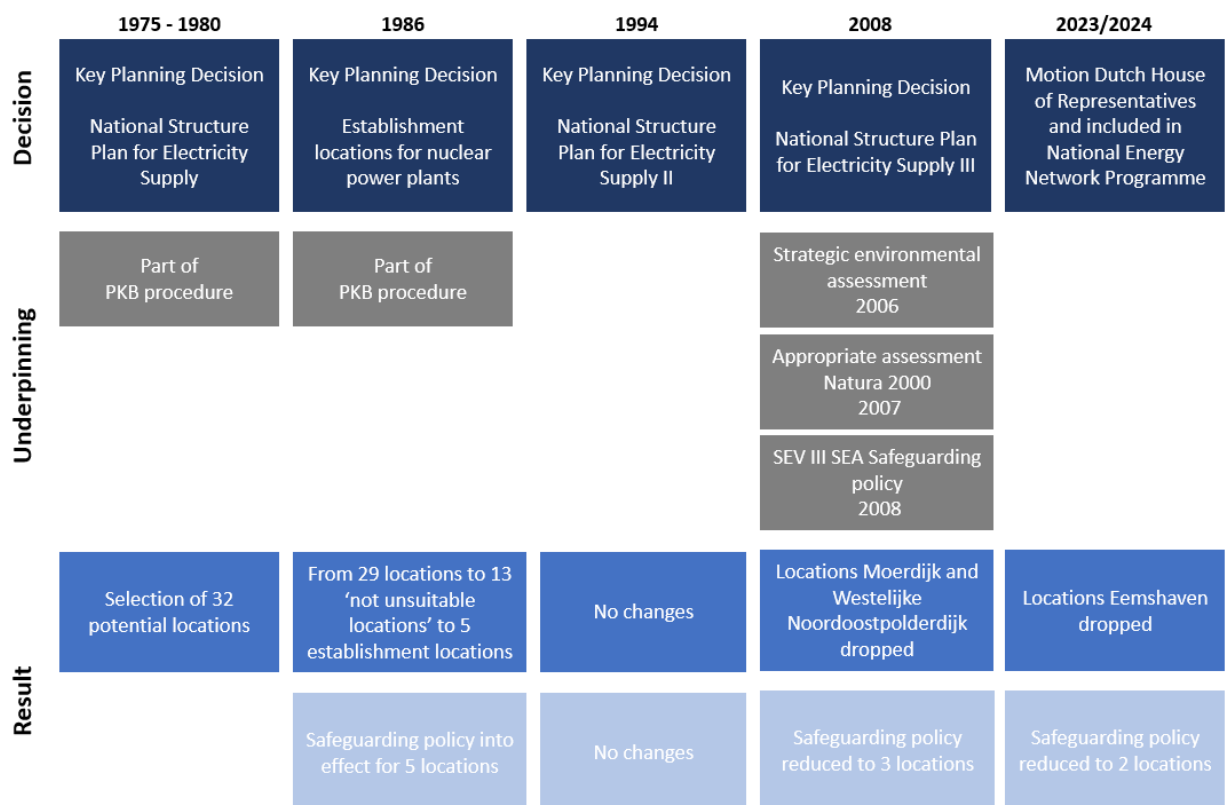


Figure 2 Process decision-making and selection of safeguarding locations

2.2 Designation of potential promising locations in the (first) National Structure Plan for Electricity Supply (SEV).

The policy of establishment locations for nuclear power plants dates back to the first National Structure Plan for Electricity Supply (SEV). This National Structure Plan was published in 1975 by the Ministers of Economic Affairs and Public Housing and Spatial Planning. The plan contained an overview of possible establishment locations for electricity power stations. These locations were potentially suitable for a total production capacity in excess of 1,000 MW. The selection was made on the basis of a study into cooling facilities (a location close to large waters) and different environmental aspects (such as safety, noise and soil), recreation and landscape aspects.

Eventually, in the 1980 Policy Document on Energy Policy, 32 locations were selected as potentially promising. These locations appear in Figure 3.

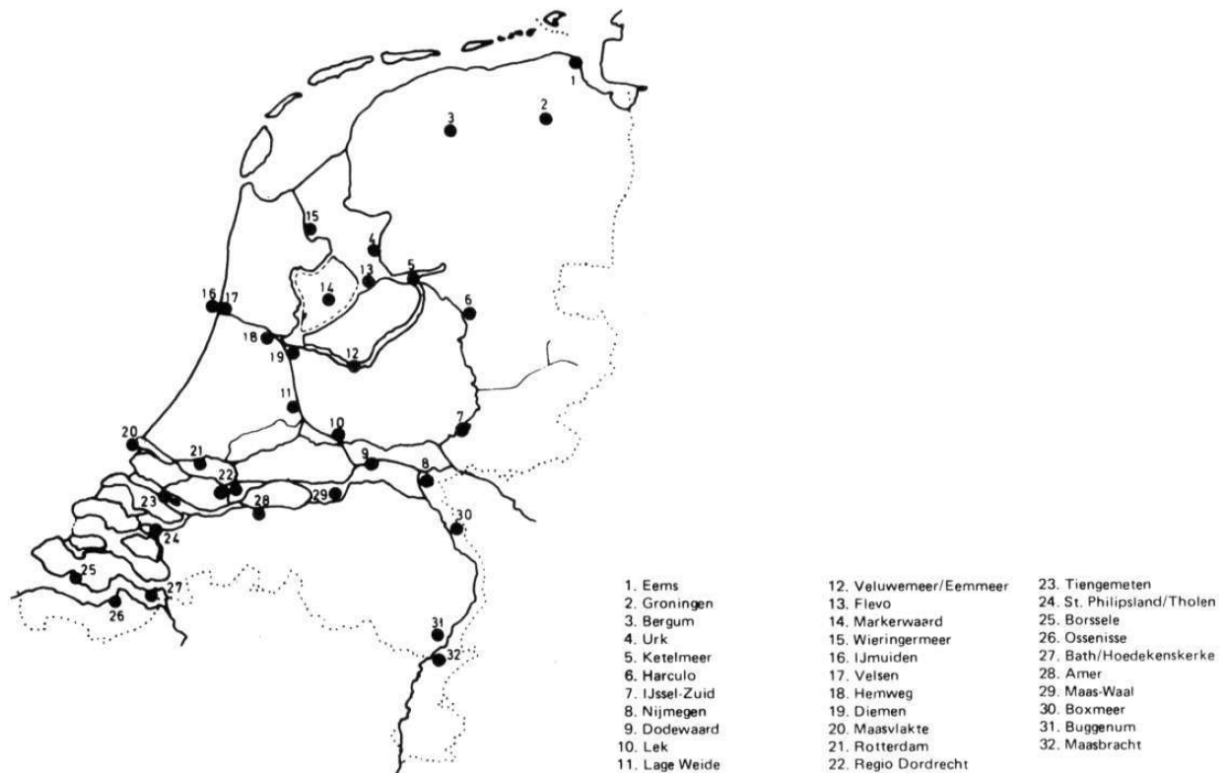


Figure 3 Overview of 32 establishment locations for nuclear power plants (Policy Document on Energy Policy, part 3: Fuel tasks power plants, Parliamentary Papers, 15802, 1979-1980)

In part D of the Structure Plan (Government Decision, 1980), the number of potentially suitable locations was further specified to 29 locations. The following three locations were dropped because of impossibilities based on further analyses according to the abovementioned criteria and objections from other government authorities:

- IJssel-Zuid,
- Veluwemeer/Eemmeer,
- Tiengemetten.

The location St. Philipsland/Tholen was replaced by the location Moerdijk.

Table 1 Potential locations for large-scale energy generation

Potential locations for large-scale energy generation			
1. Eems	9. Dodewaard	17. Velsen	25. Borssele
2. Groningen	10. Lek	18. Hemweg	26. Ossensisse
3. Bergum	11. Lage Weide/Utrecht	19. Diemen	27. Bath/Hoedekenskerke
4. Urk/Westelijke Noordoostpolderdijk	12. Veluwemeer/Eemmeer	20. Maasvlakte	28. Amer
5. Ketelmeer	13. Flevo (Noord)	21. Rotterdam	29. Maas-Waal
6. Harculo/Zwolle	14. Markerwaard	22. Dordrecht region	30. Boxmeer
7. IJssel-Zuid	15. Wieringermeer	23. Tiengemetten	31. Bruggenum/Roermond
8. Nijmegen	16. IJmuiden	24. Moerdijk	32. Maasbracht

The newly proposed establishment locations were not accurately determined in the Structure Plan. In certain cases, it was sufficient to indicate areas in which the establishment of power plants of this kind could be

considered. In a number of those areas, the installation of more than a single power generator unit could be possible. The Structure Plan also briefly considered the problems of the possible establishment of nuclear power plants. The government announced that these issues would be considered in further detail, in the future. Further details were provided in the Key Planning Decision 'Establishment locations for nuclear power plants'. This is described in the next section.

2.3 Reduction to five promising establishment locations for nuclear power plants

2.3.1 *Initial selection phase: from 29 potential establishment locations to 13 promising locations*

The Key Planning Decision 'Establishment locations for nuclear power plants' (hereinafter abbreviated to PKB) started with a policy proposal (part A of the PKB). This proposal listed the 29 establishment locations for large-scale energy generation (production capacity of at least 1,000 MW).

In selecting the 29 potentially suitable locations, no distinction was yet made between the type of fuel to be used. Because nuclear power plants are subject to specific considerations, in particular in respect of safety, only thirteen promising locations were left following the initial phase of the selection process.

The primary reason for the dropping of potential establishment locations in this phase was that they were in many cases located in the immediate vicinity of urban areas. The ten locations that were dropped immediately on the basis of this criterion as promising locations for a nuclear power plant were:

1. Groningen (Hunze)
2. Harculo/Zwolle
3. Nijmegen
4. Utrecht
5. Hemweg (Amsterdam)
6. Rotterdam/Waalhaven
7. Dordrecht region
8. IJmuiden
9. Velsen
10. Diemen

Ossensisse was dropped on the basis of specific circumstances. These included the presence of major high-voltage connections (380 kV connection) and the absence of port facilities.

The remaining eighteen locations were subsequently assessed according to the threshold value of 4,500 weighted residents for the most densely populated 45° sector (for an example see Figure 4). On the basis of this analysis, a further five locations were dropped:

1. Dodewaard
2. Lek
3. Amer (Geertruidenberg)
4. Buggenum/Roermond
5. Maasbracht

It was also recorded in respect of these locations that problems would probably arise with the availability of sufficient (reserve) cooling water, so that in addition to the population criterion, they would have also been dropped on the basis of that criterion (see Energy Policy, part D: fuel document, page 281, Parliamentary Papers 1980).

In identifying the criteria and assessment method employed, in accordance with the system of the Key Planning Decision, various scientific bodies were consulted, such as the Health Council and the RARO (Council of Advice for Spatial Planning).

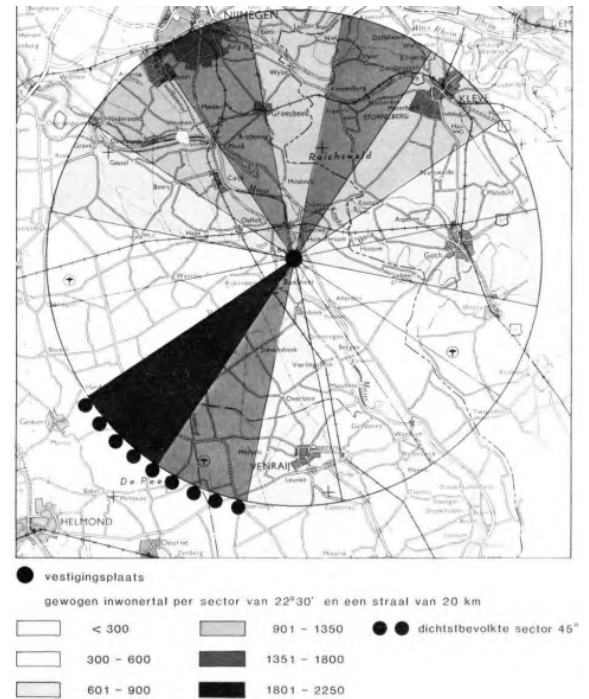


Figure 4 Example of determination of population size with 45° sector

2.3.2 Second selection phase: from thirteen to five suitable locations

In the second phase of the selection process for identifying promising establishment locations for nuclear power plants, the thirteen remaining locations were further investigated. These thirteen locations are listed in Table 2.

Table 2 Thirteen remaining potential establishment locations for nuclear power plants

Potential locations for large-scale energy generation			
1. Eems	9. Dodewaard	17. Velsen	25. Borsele
2. Groningen	10. Lek	18. Hemweg	26. Ossensisse
3. Bergum	11. Lage Weide	19. Diemen	27. Bath/Hoedekenskerke
4. Urk/Westelijke Noordoostpolderdijk	12. Veluwemeer/Eemmeer	20. Maasvlakte	28. Amer
5. Ketelmeer	13. Flevo (Noord)	21. Rotterdam	29. Maas-Waal
6. Harculo/Zwolle	14. Markerwaard	22. Dordrecht region	30. Boxmeer
7. IJssel-Zuid	15. Wieringermeer	23. Tiengemetten/Zuidelijke Hoeksche Waard	31. Buggenum/Roermond
8. Nijmegen	16. IJmuiden	24. Moerdijk	32. Maasbracht

The thirteen locations were subsequently investigated on the basis of a range of criteria. These criteria are in fact also used today in the framework of environmental impact assessment (EIA) guidelines and protocols from the International Atomic Energy Agency (IAEA). Figure 5 shows the results of the eventual assessment. In this assessment matrix, 3 is the best and 1 the worst score.

	Criteria											
	Bevolkingsomvang			Ruimtelijke ordening en milieu				Technische en economische aspecten				
	Bevolkingsdichtheid	Vlootende bevolking	Totaal	Koelwaterkwaliteits	Ecologie en landschap	Ruimtelijk beleid	Totaal	Aardbodembodemgebruik	Aanwezigheid infrastructuur	Aankoppeling aan het net	Koelwatervermogen	Totaal
1. Bath/Hoedekenskerke	2	2	2	2	2	1	2	2	2	3	2	3
2. Bergum	3	2	3	3	2	1	2	2	1	3	3	3
3. Borsele	2	2	2	1	1	1	1	3	1	3	1	2
4. Boxmeer	3	2	3	2	3	2	3	2	2	1	3	2
5. Eems	1	1	1	2	2	1	2	2	1	3	1	2
6. Flevo-Noord	1	1	1	3	1	3	3	3	2	1	1	2
7. Ketelmeer	1	1	1	3	2	1	2	2	2	1	1	1
8. Maasvlakte	2	2	2	1	2	2	2	3	1	2	1	2
9. Maas/Waal	3	2	3	2	3	2	3	2	2	2	3	3
10. Markerwaard/Houttribdijk	1	1	1	3	1	2	2	1 à 2	2	2	1	1 à 2
11. Moerdijk	3	2	3	2	2	2	2	3	1	1	3	2
12. Westelijke Noordoostpolderdijk	1	1	1	3	1	1	2	2	2	1	1	1
13. Wieringermeer	1	2	1	3	1	1	2	2	2	3	1	2

Figure 5 Assessment matrix from the Key Planning Decision Establishment locations for nuclear power plants (1984-1985)

The handling of cooling towers

In the analyses and the reduction in numbers of promising establishment locations for nuclear power plants, cooling towers are not by definition excluded. In the PKB, part A, the following statement is made: 'Assuming two units per establishment location, a cooling capacity of 2700-3900 MWe must be achievable. In respect of the financial disadvantages of using cooling towers, it also seems obvious that establishment locations offering significant cooling capacity by surface water will be scored more positively than locations where only limited cooling capacity is available, or the use of cooling towers is essential.' The use of cooling towers will also require more space and at certain locations will result in negative impact in relation to landscape quality. Above all at riverside locations, cooling towers will be needed.

2.3.3 Recording of promising locations in the Key Planning Decision: three locations with two locations requiring further investigation

On the basis of the further studies into the thirteen locations in combination with the consultation process, five locations were identified as promising:

- Borsele;
- Maasvlakte;
- Eems(haven);
- Westelijke Noordoostpolderdijk;
- Moerdijk.

The locations 'Moerdijk' and 'Westelijke Noordoostpolderdijk' were included with the statement that they required further investigation. For Moerdijk, among other things, it was indicated that possible points for attention were present, given the local population size and the potential impact on drinking water. For the location 'Westelijke Noordoostpolderdijk', on the basis of a series of studies, attention points relating to drinking water supply and general water management aspects emerged. The publication on 27 January 1986 of the PKB marked the end of the policy and planning process.

2.3.4 Establishment and content of the 'safeguarding policy'

The completion of the PKB also meant that the safeguarding policy came into effect. In this policy, five locations were listed, including a 5-kilometre zone in which spatial restrictions were imposed. This was explained as follows:

Distance	Policy
0 – 1 kilometre	The policy is aimed at maintaining the favourable low population density and preventing the establishment of facilities that could result in the presence of large numbers of difficult to move people.
1 – 5 kilometres	As 0-1 km, with possible exceptions if other interests also play a role.
5 – 20 kilometres	The policy is in principle aimed at ensuring that existing and currently intended spatial developments can as far as possible be implemented. There are no explicit measures in this area.

2.4 Continuation of the safeguarding policy in the Second National Structure Plan for Electricity Supply (SEV II)

In the Second National Structure Plan for Electricity Supply from 1994, the safeguarding policy from 1986 was continued. No specific amendments were made.

2.5 From five to three safeguarding locations in the Third National Structure Plan for Electricity Supply

2.5.1 *Investigation within the SEA leads to exclusion of locations Moerdijk and Westelijke Noordoostpolderdijk*

In 2008, the five safeguarding locations were further investigated in an environmental impact assessment (SEA) to the Third National Structure Plan for Electricity Supply. In this SEA, an extensive assessment framework was employed, based on the previous PKBs and the Site Evaluation on Nuclear Installations by the International Atomic Energy Agency (IAEA). Figure 6 shows the final assessment of the five locations. Here too, 0 is a low score and 2 is a high score.

Based on this SEA, the close proximity of densely populated areas and safety measures scored particularly poorly for Moerdijk. Points for attention were also raised relating to cooling water. The 'Westelijke Noordoostpolderdijk' location also scored unsatisfactorily on two topics: impact on the food chain and impact on the drinking water supply. There was also a negative score for transport facilities by road, rail and water. For these reasons, these two locations were dropped, leaving only Borsele, Maasvlakte and Eemshaven as safeguarding locations.

		Bors- sele	Eems	Maas- vlakte	Moer- dijk	WNOP -dijk
Randvoorwaarden						
Ligging	De locatie ligt niet binnen 5 km van een dicht-bevolkt gebied	2	2	2	0	2
Veiligheid	Preventieve en rampbestrijdingsmaatregelen moeten mogelijk en uitvoerbaar blijven	2	2	2	0	2
Criteria						
In relatie tot een veilige bedrijfsvoering						
Weersomstandigheden	risico's voor stormen en tornado's, overstromingen en brand	1	2	2	2	1
Bodemstabiliteit	risico's voor aardverschuivingen, waterafvoer, aardbevingen en instortingen	2	1	2	1	2
Koelwater	beschikbaarheid koelwater	2	2	1 á 2	1	1 á 2
Explosiegevaar vanaf land en water	risico's op explosies, o.b.v. aanwezigheid gevaarlijke bedrijven en scheepvaartroutes gevaarlijke stoffen	1	1	1	1	2
Neerstortingsgevaar	neerstortingsgevaar van vliegtuigen	2	2	2	2	2
Nautische veiligheid en gevaar door olierampen	risico's door olierampen, o.b.v. ligging scheepvaartroutes, intensiteiten en het risico voor verspreiding in de richting van de locatie	1	1	1	1	1
In relatie tot de beïnvloeding van de omgeving						
Straling	- dosisbelasting bevolking (normale emissie) - transportmogelijkheden via weg, spoor, water	2 2	2 2	2 2	2 2	2 0
Voedselketen	gebruik van bodem en water in omgeving	1	1	1	2	0
Algemene hinder	afstanden tot nabijgelegen woongebieden	2	2	2	1	2
Vernietiging of aantasting natuurlijke waarden en natuurgebieden	Natura 2000-gebieden, Ecologische Hoofdstructuur, weidevogel en -ganzenfourageergebieden	1	1	1	1	1
Vernietiging van grote hoeveelheden (water) organismen	(water)-organismen nabij koelwaterinlaat	1	1	2	2	2
Bodem- en grondwaterverontreinigingen	milieubeschermingsgebieden (inclusief grondwater- en bodembeschermingsgebieden)	2	2	2	2	2
Verspreiding verontreinigingen	kwel of inzijsituatie, richting en snelheid grondwaterstromingen	2	2	2	2	2
Lozing koelwater op zoetwatervoorraad	oppervlaktewater, dat wordt gebruikt als zoetwatervoorraad	2	2	2	2	0
Mogelijkheden om koeltoren achterwege te kunnen laten	aard en hoeveelheid koelwater in omgeving	2	2	1	1	1
Aantasting archeologie en cultuurhistorie	aanwezigheid van archeologisch en cultuurhistorisch waardevolle gebieden en structuren	2	2	2	2	2
Aantasting landschappelijke waarden	het landschap in de omgeving	1	1	2	2	1

Figure 6 Assessment table SEA 2008 for the five locations

2.5.2 Maasvlakte II in the picture as an option but not included in the safeguarding policy

The PKB Project Mainport Development Rotterdam (2006) specified that the land reclamation in Maasvlakte II primarily offered space for deepsea-related activities, for example specific large-scale container storage and transshipment and the directly related distribution activities. The Maasvlakte II land reclamation area also offered space for large-scale deepsea-related chemical activities.

The PKB explicitly specified the possibility of other activities at the Maasvlakte II location under special circumstances and on the basis of careful considerations. Because of the restrictions arising from the construction of Maasvlakte II in terms of cooling water discharge from Maasvlakte I, for the establishment of electricity power

plants at Maasvlakte II there are clear 'special circumstances' as intended in the PKB Project Mainport Development Rotterdam (2006). For example, this PKB specifies that electricity power plants are a possibility subject to careful consideration and taking account of the following aspects:

- To what extent alternative locations are available;
- To what extent establishment on the land reclamation delivers major benefits for the quality of the living environment (possibly elsewhere);
- To what extent the establishment generates important cluster benefits;
- To what extent these benefits are not at the expense of a proportional or irresponsible share of the space reserved for deepsea-related activities;
- The operating principle is that of an overall cost price.

Three promising locations had already been designated in the Third National Structure Plan for Electricity Supply (SEV III). As a consequence, it was not necessary to add Maasvlakte II to this number, also because policy space had been created to view Maasvlakte II as a reasonable alternative, if it were subsequently to emerge that other locations were not sufficiently promising.

2.6 Updating of the safeguarding policy in the National Energy Network Programme (PEH) and the Environmental Quality Decree

In the (draft) National Energy Network Programme (PEH) from 2023, the safeguarding policy for Borsele and Maasvlakte I was reconfirmed. It was stated that the target would be to construct two new nuclear power plants (generation III+ reactors) with a combined capacity of approx. 3 GW before 2035. Eemshaven was also dropped as a safeguarding location.

The dropping of Eemshaven as a safeguarding location originated in a legislative consultation meeting on 4 March 2021. In these discussions, a motion was adopted stating that Eemshaven should be scrapped as a safeguarding location. Parliament also expressed the intention to not build a nuclear power plant in the province of Groningen. The reason stated in the motion is that in Groningen the consequences of gas extraction are still considerable and earthquakes have not halted.

2.7 Current safeguarding policy adopted in the Environmental Quality Decree

The current safeguarding policy is adopted in Article 5.158 of the Environmental Quality Decree (safeguarding nuclear power plant locations). From spring 2024 onwards, this article lists the two safeguarding locations together with their geographical demarcation. The following rules also apply:

In so far as the location for a nuclear power plant and the area within a radius of one km around that location is subject to an environment plan, the environment plan will not allow:

- a. The construction of buildings with a residential function, if as a consequence thereof the number of residents in the area exceeds 5,000; and
- b. the construction or realisation of other vulnerable or very vulnerable buildings or vulnerable locations with the exception of a nuclear power plant at the location or vulnerable or very vulnerable buildings and vulnerable locations that in the judgement of the competent authority are necessary for the area, or for an activity permitted within the area.

About Antea Group

Antea Group is home to 1500 proud engineers and consultants. Together, every day, we help build a safe, healthy and future-proof living environment. Our organisation brings together the very best technical specialists in the Netherlands, who together provide innovative solutions in the field of data, sensing and IT. In this way, we contribute to the development of infrastructure, residential districts and water structures. We also contribute to issues relating to climate adaptation, energy transition and the replacement challenge. From research through to design and from realisation to management: for every task, we supply the appropriate knowledge base. We contribute critical ideas, always with the mindset of working together to achieve the best result. In this way, we anticipate the questions of today and the solutions of tomorrow, as we have for the past 70 years.

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