# Prinos and the North Sea: why the comparison does not hold

An assessment of the Öko-Institut publication eco@work 09/2026 in the light of the particular conditions of the Prinos area

A few days ago, on 15 September 2026, the German Öko-Institut published its new issue under the title «CCS – eine sinnvolle Maßnahme für den Klimaschutz?» («CCS – a useful measure for climate protection?»). The publication examines the role that CCS technology can play on the path towards climate neutrality and, under certain conditions, identifies fields in which its application may be considered useful.

A different question, however, is of particular interest: to what extent are the same scientific and environmental criteria applied to the assessment of $CO_2$ storage sites in the North Sea also applied in the case of Prinos?

That is precisely the purpose of this paper: to examine whether the criteria and conditions highlighted by this German publication can be applied to the planned CCS project at Prinos.

*This paper assesses a single publication and replaces neither a geological nor a legal expert opinion. Mapping the Öko-Institut's criteria onto the Prinos site is an analogy drawn from the state of the art, not an application of Greek law in force.*

## 1. The result in one sentence

**Principal finding**

The Öko-Institut publication is fundamentally IN FAVOUR of CCS. It nevertheless contains three findings that stand directly against the Prinos project — and not as incidental remarks, but as site-selection criteria.

First: seismic activity and active faults in the subsurface are recorded explicitly as EXCLUSION CRITERIA, not as manageable risks. [7]

Second: a researcher at the Öko-Institut states that the Mediterranean region has less favourable geological conditions and risks arising from fault structures in the subsurface. [3]

Third: the marine seismologist quoted in the Öko-Institut publication sets magnitude 3 as the threshold of harmlessness and magnitude 4 to 5 as critical — and bases the suitability of the North Sea expressly on the fact that such earthquakes practically do not occur there. In the North Aegean they do occur. [1], [12]

The third point is the strongest in argument, because it ties the finding of suitability to a condition that is not met at Prinos.

## 2. What this source is — and what it is not

This classification deliberately precedes the assessment.

| Feature | Assessment |
|---|---|
| Form of publication | eco@work is the magazine of the Öko-Institut, ISSN 1863-2009, print run 1,600 copies. It is NOT a peer-reviewed study but a journalistic rendering of several underlying pieces of research [2] |
| Basic stance | Clearly in favour of CCS. The management opens the issue with the position that there is no way forward without CCS, invoking the IEA and the IPCC [2] |
| Assessment of offshore storage | It is described there as involving relatively low environmental risks; leakage is regarded as rather unlikely and the exposure risk for people as low [6] |
| Reference to Prinos | None. Greece is not mentioned anywhere in the issue. The Mediterranean region appears in exactly one sentence [3] |
| Usability | High as regards the site-selection criteria and the magnitude threshold. Low to damaging if the issue is presented as a text critical of CCS |

**Urgent warning on use**

The substance of the wording: not «CCS is dangerous», but «even its supporters would not store at Prinos».

# 3. The usable findings in detail

## 3.1 Exclusion criteria for site selection

Dr Florian Krob, a geoscientist at the Öko-Institut, sets out binding minimum requirements for site selection and, separately from these, exclusion criteria. The distinction is decisive: minimum requirements can be met, whereas exclusion criteria rule out a positive site decision.

| Category | Content according to the Öko-Institut |
|---|---|
| Minimum requirements | Sufficient storage capacity; a geological depth of at least 800 metres; a minimum thickness of the primary sealing caprock; long-term stability and integrity of that barrier; favourable injectivity [7] |
| Exclusion criteria | Active faults in the subsurface; large-scale vertical movements; seismic or volcanic activity; impairment of usable groundwater [7] |

*Source: eco@work 09/2026, p. 11, article «Ab unter die Nordsee? Standortauswahl für die Kohlenstoffspeicherung».*

## 3.2 The Mediterranean region

Christoph Heinemann, Senior Researcher in the Energy and Climate division, compares the North Sea with the Mediterranean region. He describes the geology beneath the North Sea as well explored thanks to decades of oil and gas extraction, and sets against it the Mediterranean region, for which he cites less favourable geological conditions and potential risks from fault structures in the subsurface. [3]

This is the only passage in the issue that deals with the Mediterranean region at all. It is short, not supported by data, and in the original serves the comparison rather than the assessment of specific projects. It nonetheless remains usable, because it comes from an institute that supports CCS and because the direction is unambiguous.

*Source: eco@work 09/2026, p. 6, article «CCS – wieso, wofür, wieviel?».*

## 3.3 The magnitude threshold — the strongest point

Dr Florian Schmid, head of the seismic systems department at K.U.M. Umwelt- und Meerestechnik Kiel GmbH, comments on the seismic suitability assessment of storage sites. His statement has a structure that is decisive for transfer to Prinos:

| Step in the argument | Finding | Situation at Prinos |
|---|---|---|
| Threshold of harmlessness | Up to magnitude 3 an earthquake is considered non-critical; no damage is expected [1] | Regularly exceeded in the North Aegean [12], [13] |
| Critical threshold | From magnitude 4 or 5 the situation becomes critical [1] | Clearly and repeatedly exceeded |
| Basis of the suitability finding | Such earthquakes practically do not occur in Germany [1] | The condition on which the finding of suitability rests is NOT met here |
| Conclusion in the original | From a seismological point of view nothing speaks against $CO_2$ storage in the North Sea [1] | The conclusion is bound to the condition and therefore cannot be transferred |

*Source: eco@work 09/2026, p. 2, article «Wal, Schiff oder Beben? Passives seismisches Monitoring für die $CO_2$-Speicherung».*

**Why this point is methodologically clean**

This is not selective quotation. The expert states a threshold AND bases his positive assessment expressly on the fact that this threshold is not reached in the area under consideration.

Anyone applying the same threshold to an area where it is exceeded is applying the criterion — not distorting it. That is the difference between an argument and a sleight of hand, and it becomes visible in any rebuttal.

Limit of the finding: it concerns the SUITABILITY ASSESSMENT of an area, not the safety of a site that has already been characterised. Nothing further should be inferred from it.

## 3.4 Injection-induced microseismicity

The same article notes that injection can release stresses in the form of micro-earthquakes [1]. In itself this is undisputed technical knowledge and is presented in the issue as manageable — it is precisely what justifies the need for monitoring. For Prinos only one aspect is decisive: if injection releases stresses and the region is tectonically active in any case, the question of the interaction between the two arises.

### 3.5 Re-use of fossil-fuel infrastructure

Krob points out that additional risks arise when existing infrastructure from the fossil-fuel industry is to be re-used, and describes such infrastructure as technically incompatible with the requirements of $CO_2$ storage [6]. In the original this refers to pipelines.

For Prinos the parallel is obvious but not identical: there the matter concerns 76 wells in a depleted oil field and their plugs. The finding of the issue therefore cannot be transferred as it stands — but it does support the general caution towards converting fossil-fuel installations and connects to the question already raised about proof of well integrity.

### 3.6 Failure of predictions at existing projects

The issue reports substantial cost overruns at the Norwegian projects Sleipner and Snøhvit due to operational difficulties during injection [6]. It expressly names the risk that the rock formations do not display the injection and storage behaviour that had been predicted.

This is useful because these are the best-explored storage sites in Europe. If the predicted behaviour fails to materialise there, transferring model calculations to a less well explored site requires additional justification.

### 3.7 The timing of the in-depth assessment

Krob criticises the fact that the legal framework provides for the in-depth assessment only with the field investigations carried out by the operators, and expressly judges this to be too late [7]. What is required is a procedure that makes clear at an early stage which areas are ruled out on environmental grounds, safety grounds or because of conflicts of use.

This criticism is directed at the German procedure. It nevertheless applies structurally to the Greek case as well: the in-depth assessment rests with the project operator, while no prior state-level screening for area exclusion has taken place.

### 3.8 Further connectable points

| Finding of the issue | Connection to the Prinos case |
|---|---|
| Independent third-party oversight and confidential reporting of irregularities are required [6] | ΕΔΕΥΕΠ is simultaneously the licensing authority and a promoter of the project. No independent third authority exists |
| Environmental impact assessments should be extended to indirect effects as well; multidimensional spatial planning is called for to avoid conflicts in ecologically sensitive areas [6], [8] | Natura 2000 site GR1150014; absence of conservation objectives; the CJEU ruling of 16.07.2026 already invoked |
| In the North Sea, storage should follow the principle «the less, the better» [7] | The licensed capacity of 18.5 million tonnes with an expansion option to 60 million tonnes follows the opposite principle |
| CCS should be used only where emissions cannot be avoided, not where renewables or green hydrogen are feasible [3] | Import of $CO_2$ from five Member States; parallel oil production until 2035 |
| The EU guidelines provide for a 20-year post-closure period, whereas Germany provides for 40 years [6] | See the verification note in section 6.2 — there is a discrepancy with our own presentation to date |
| Experience from Denmark shows that an early, systematic and transparent procedure significantly increases acceptance [7] | Directly connectable to the questions about the claimed social acceptance from the HERCCULES programme |
| Costs of 150 to 300 euros per tonne against an emissions trading price of around 85 euros; project development times of six to thirteen years [4] | Viability argument; decisive for the question of continued public funding |

## 4. Criteria comparison for Prinos

The following comparison applies the list of criteria from section 3.1 to the site. It is deliberately honest also where the criteria are likely to be met.

| Criterion | Requirement | Situation at Prinos | Assessment |
|---|---|---|---|
| Depth ≥ 800 m | Minimum requirement | The Prinos reservoir lies considerably deeper. The exact figure is to be documented from the EIA | Probably MET |
| Storage capacity | Minimum requirement | 18.5 million tonnes licensed, expansion to 60 million tonnes foreseen [15] | MET |
| Thickness and integrity of the caprock | Minimum requirement | Evaporitic caprock of about 300 m (salt, anhydrite) — favourable material. It is, however, penetrated by 65 to 76 wells, and upward migration of hydrocarbons is documented at two other fields in the basin [18][19] | OPEN, proof lacking |
| Favourable injectivity | Minimum requirement | No publicly accessible assessment | OPEN |
| Active faults in the subsurface | EXCLUSION CRITERION | The North Aegean is a tectonically active region. Site-specific fault mapping is not public | NOT DEMONSTRATED that the criterion is satisfied |
| Seismic activity | EXCLUSION CRITERION | See section 5 | NOT SATISFIED at regional level |
| Large-scale vertical movements | EXCLUSION CRITERION | No publicly accessible assessment | OPEN |
| Impairment of usable groundwater | EXCLUSION CRITERION | Offshore site; secondary in this case | Probably not applicable |

**An honest reading of the table**

Two of the eight criteria are probably met. Four remain open. One is not satisfied at regional level.

The burden of the argument therefore does not rest on the claim that the site is demonstrably unsuitable. It rests on the considerably better documented finding that proof of suitability for the decisive criteria HAS NOT BEEN FURNISHED.

That is the stronger position, because it is not for us to prove it, but for the project operator.

## 5. The seismic question in detail

### 5.1 Tectonic data

| Feature | Factual position |
|---|---|
| Position in the plate system | The Aegean plate moves relative to the Eurasian plate at about 30 mm per year towards the south-west; the African plate subducts northwards beneath it at about 40 mm per year [13] |
| Regional structure | In the north-western Aegean, extension on east-west striking faults coincides with right-lateral strike-slip movement in a SW-NE direction. The North Aegean Trough is the western continuation of the North Anatolian Fault [13] |
| Strongest documented events in the wider region | 26 September 1932, Ierissos in Chalkidiki: magnitude 7.0 according to ΟΑΣΠ; individual sources give 7.1. 161 dead, 669 injured, 4,106 houses destroyed [12] · The great earthquake of 1829: on 5 May 1829, centred on the wider Xanthi–Drama area. The magnitude is today estimated at about 7.3 |
| Distance of the event from the site | Ierissos lies about 150 km west of the Gulf of Kavala. The event documents the magnitude potential of the region, not the hazard to the storage complex |

*Sources: ΟΑΣΠ, entry for 26 September 1932. — Accounts of the tectonics of the north-western Aegean. Retrieved 18.09.2026.*

## 5.2 What follows — and what does not

- Defensible: the region regularly exceeds the critical magnitude threshold of 4 to 5 cited in the issue and has historically reached magnitude 7. The condition on which the suitability of the North Sea is founded is not present here.
- Equally defensible: seismic activity is an exclusion criterion in the Öko-Institut's list of criteria. A site in a region with this seismicity would not have passed the pre-selection under that methodology.
- NOT defensible: equating regional magnitude potential with site hazard. A magnitude 7 earthquake 150 km away is seismologically something different from a magnitude 5 earthquake on a fault cutting through the storage complex. Anyone conflating the two will be corrected by any expert witness.
- The genuinely decisive quantity is not the maximum regional magnitude, but first the distance of active faults from the storage complex, second the ground motion to be expected at the site over the time horizon under consideration, and third the potential for injection-induced reactivation of those faults.

### Where the two converge

Precisely these three quantities are the subject of the quantitative seismic hazard assessment that the two seismologists demand in their report filed with the Council of State — with a time horizon of centuries — and which, according to their finding, was not carried out. [14]

The Öko-Institut material supports this demand methodologically: it shows that in a selection procedure built to the state of the art, seismic activity is not assessed after the fact but examined beforehand as a ground for exclusion.

The defensible formulation is therefore not «an earthquake will destroy the reservoir here», but: «The assessment that, according to the state of the art, should have preceded the site decision did not take place.»

## 6. Limits, counter-arguments and one verification note

### 6.1 How the other side will respond

| Expected rebuttal | Soundness | Possible answer |
|---|---|---|
| The Öko-Institut expressly supports CCS | Correct and documented | Not disputed. That is precisely why the criteria hold: they do not come from opponents of the project |
| The issue assesses offshore storage as low-risk and leakage as unlikely | Correct | That assessment concerns the North Sea and sites that have passed the exclusion criteria. Prinos was not subjected to that examination |
| Depleted hydrocarbon reservoirs are named in the issue as suitable in principle | Correct | Suitability in principle of the reservoir type does not replace examination of the specific site. The issue requires both |
| A magazine article is not a scientific source | Correct, and the strongest counter-argument | That is why the underlying studies must be obtained — see 6.3 |
| The criteria were developed for the North Sea and for German law | Correct | They nevertheless claim to reflect the state of the art. Directive 2009/31/EC requires site characterisation according to the state of the art |

### 6.2 Verification note on our own presentation

**Possible discrepancy in the post-closure period**

The issue gives a post-closure period of 20 years for the EU guidelines and 40 years for Germany.

In the list of questions we submitted on 15.09.2026, a 30-year period under Article 20 of Directive 2009/31/EC is mentioned. [17], [16]

These figures cannot readily be reconciled. The factual position must be checked.

Independently of this, the comparison itself is usable: Germany has doubled the period relative to the European requirement. The question of which period applies in Greece, and why, is therefore legitimately raised.

### 6.3 The sources that should actually be obtained

For a submission or for use in court, the magazine should not be cited, but rather the studies to which it refers. All three are public.

| Study | Commissioned by / framework | Importance |
|---|---|---|
| [9] «Anforderungen an ein Verfahren zur Identifikation umweltverträglicher $CO_2$-Speicher» | German Federal Environment Agency (Umweltbundesamt) | HIGHEST. This is where the list of criteria with the exclusion criteria is set out. A methodology commissioned by a German federal authority carries different weight before a court than a magazine article |
| [10] «Securing the Underground – Managing the Risks of Carbon Storage through Effective Policy Design» | Initiative of NABU, funded by the European Climate Foundation | HIGH. Risks of offshore storage, regulatory gaps, Sleipner and Snøhvit, re-use of fossil-fuel infrastructure |
| [11] «Carbon Capture and Storage (CCS) in der Energiewende zur Klimaneutralität» | Öko-Institut together with Agora Industrie | MEDIUM. Capacities, costs, transport, market ramp-up. Chiefly for the question of viability |

## 7. Defensible formulations

The following sentences are covered by the material assessed and will withstand expert rebuttal.

**Usable**

«A research institute that expressly supports CCS records seismic activity and active faults in the subsurface as exclusion criteria for site selection — not as manageable risks.»

«The marine seismologist quoted in the same issue describes earthquakes from magnitude 4 to 5 as critical and bases the suitability of the North Sea expressly on the fact that such earthquakes practically do not occur there. In the North Aegean they do.»

«The same institute states that the Mediterranean region has less favourable geological conditions and risks from fault structures in the subsurface.»

«According to the state of the art set out there, seismic activity is examined as a ground for exclusion before the site decision. In the case of Prinos, according to the finding of the seismological report filed with the Council of State, no such examination took place.»

«The criticism that the in-depth assessment is made only by the project operator, and therefore too late, is levelled by the same experts at the German procedure. It applies in the same way to the Greek case.»

## 8. List of sources

The numbers in square brackets in the text refer to this list. Page references relate to the printed edition of eco@work 09/2026.

### 8.1 Primary source assessed

| No. | Reference | Content |
|---|---|---|
| [1] | eco@work 09/2026, p. 2 — «Wal, Schiff oder Beben? Passives seismisches Monitoring für die $CO_2$-Speicherung», interview with Dr Florian Schmid, K.U.M. Umwelt- und Meerestechnik Kiel GmbH | Magnitude thresholds of 3 and 4 to 5; basis of the North Sea suitability finding; injection-induced microseismicity; monitoring with ocean-bottom seismometers |
| [2] | eco@work 09/2026, p. 5 — editorial by Anke Herold, spokesperson of the management of Öko-Institut e. V., and masthead | Basic stance of the issue on CCS; reference to the IEA and the IPCC; ISSN 1863-2009; print run 1,600 |
| [3] | eco@work 09/2026, p. 6 — «CCS – wieso, wofür, wieviel?», Christoph Heinemann, Senior Researcher Energy & Climate | Comparison of the North Sea and the Mediterranean region; less favourable geological conditions and risks from fault structures; CCS only for unavoidable emissions |
| [4] | eco@work 09/2026, p. 7 — continuation of the same article | Costs of 150 to 300 euros per tonne; emissions trading price of around 85 euros; project development times of six to thirteen years; KSPTG |
| [5] | eco@work 09/2026, p. 8 — «Ab unter die Nordsee? Standortauswahl für die Kohlenstoffspeicherung», Dr Florian Krob, Senior Researcher | European storage projects; mention of the analysis «Securing the Underground»; commissioned by NABU and the European Climate Foundation |
| [6] | eco@work 09/2026, p. 10 — continuation of the same article | Independent third-party oversight; Sleipner and Snøhvit; incompatibility of re-used fossil-fuel infrastructure; classification of environmental and exposure risks; post-closure periods of 20 and 40 years; extension of the EIA to indirect effects |
| [7] | eco@work 09/2026, p. 11 — continuation of the same article | Minimum requirements and exclusion criteria for site selection; the principle «the less, the better»; criticism of the timing of the in-depth assessment; Danish experience regarding acceptance |
| [8] | eco@work 09/2026, p. 12 — profile of Karoline Schacht, Senior Policy Advisor Marine Conservation, WWF Germany | Indispensability of environmental impact assessments for CCS projects; requirements for marine protected areas |

### 8.2 Underlying studies — still to be obtained

| No. | Study | Commissioned by |
|---|---|---|
| [9] | «Anforderungen an ein Verfahren zur Identifikation umweltverträglicher $CO_2$-Speicher», Öko-Institut | Umweltbundesamt (Germany) |
| [10] | «Securing the Underground – Managing the Risks of Carbon Storage through Effective Policy Design», Öko-Institut | Initiative of NABU, funded by the European Climate Foundation |
| [11] | «Carbon Capture and Storage (CCS) in der Energiewende zur Klimaneutralität», Öko-Institut | Together with Agora Industrie |

### 8.3 Sources on the region and the procedure

| No. | Source | Use |
|---|---|---|
| [12] | Organismos Antiseismikou Schediasmou kai Prostasias (ΟΑΣΠ), entry for 26 September 1932 | Magnitude 7.0; 161 dead; 669 injured; 4,106 houses destroyed |

| No. | Source | Use |
|---|---|---|
| [13] | Scientific accounts of the tectonics of the north-western Aegean | Plate movements; coexistence of extension and strike-slip; the North Aegean Trough as the continuation of the North Anatolian Fault |
| [14] | Report by two seismologists, filed with the Council of State; reproduced in the joint statement of the associations of 11 and 12.09.2026 | Finding that the study does not meet the minimum requirements and that a quantitative seismic hazard assessment is missing |
| [15] | Storage licence, published in ΦΕΚ 121/Δ/20.02.2026 | Licensed capacity of 18.5 million tonnes with an expansion option to 60 million tonnes |
| [16] | Directive 2009/31/EC on the geological storage of carbon dioxide | Site characterisation; transfer of responsibility; post-closure care |
| [17] | List of questions from the collectives and associations of Thasos, Kavala and Nestos of 15.09.2026 | Reference to a 30-year period under Article 20 — see verification note 6.2 |
| [18] | Proedrou P. & Papaconstantinou C. M. (2004), «Prinos Basin – a model for oil exploration», Bulletin of the Geological Society of Greece | Extensional tectonics along marginal listric faults; 5,000 m of sediment; roll-over anticlines formed by the activation of growth faults |
| [19] | «Geological and geophysical data of Epsilon field in Prinos oil basin», Bulletin of the Geological Society of Greece, vol. XLIII, no. 5 (2010) | Evaporitic sequence predominantly of salt with anhydrite; upward migration of hydrocarbons at South Kavala and Ammodhis, attributed probably to fault activation |

*All internet sources retrieved on 18 September 2026. The primary source [1] to [8] is available as a PDF and was assessed in full.*