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# 36th IEA ES OnSeminar

# Interactive communication about Large Thermal Energy Storages (LTES)

Thursday, April 23rd, 2026

14:00 – 15:00 (CET)

Learn more at https://iea-es.org/task-45/

Presenter: Geoffroy Gauthier

PlanEnergi

# PlanEnergi is a Danish renewable energy consultancy






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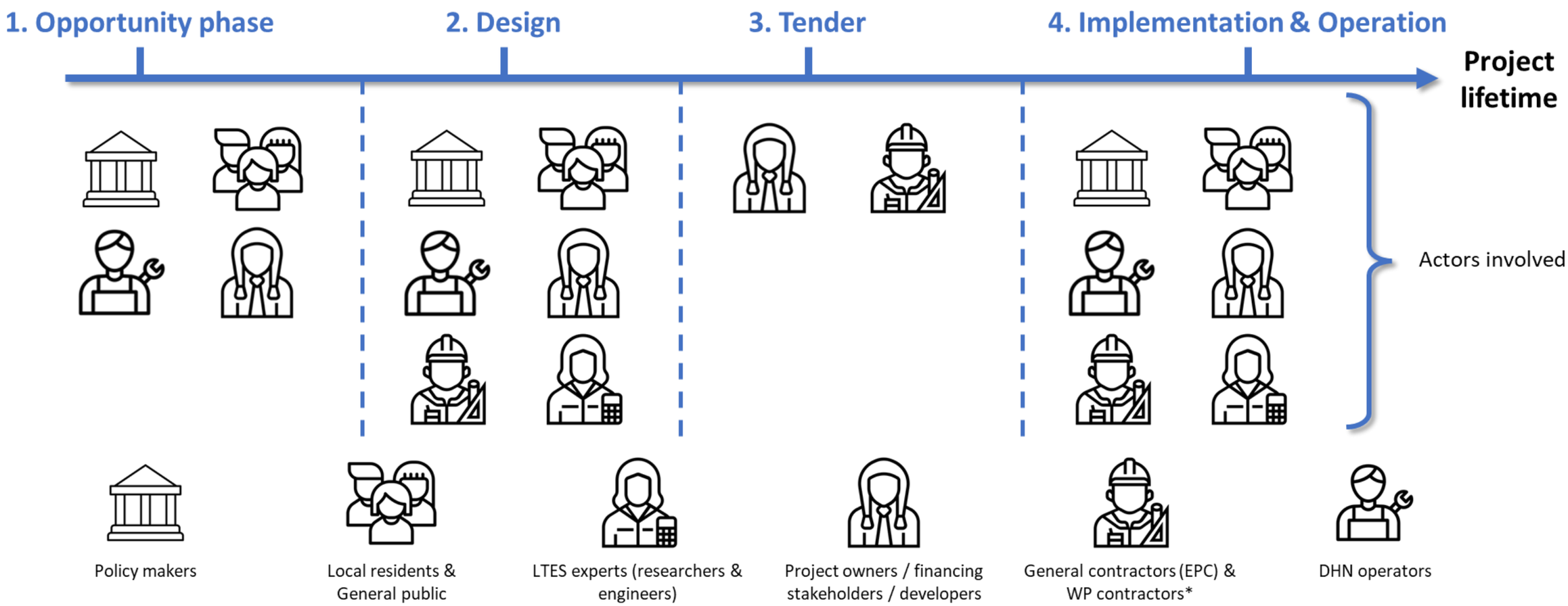
# LTES implementation takes place in 4 main phases




Extract from: [IEA ES Task 39 deliverables]

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# Dissemination is done through 3 activities

- General dissemination
  - Participation to conferences, articles, webinars, etc.
- Improved concepts of LTES
  - Inventory of LTES projects improving LTES technologies (report/deliverable)
    - Aimed at technical stakeholders but also policy makers
    - Published in several chapters
- Knowledge base for decision makers
  - Webinars and Q&A sessions
    - Tailored to specific audience
    - Evaluation of sessions
    - Online form for questions
    - Q&A bank

# Topics covered by the knowledge base

Webinar 1: Planning, legal & societal aspects of LTES implementation + financial aspects ✓

Project owners / financing stakeholders / developers

Policy makers

Local residents & General public

Webinar 2: Technical aspects of LTES (feasibility, design, tender, monitoring, etc.) + economic aspects ✓

Researchers & engineers

Project owners / financing stakeholders / developers

Webinar 3: Practical experiences with LTES + economic aspects

Project owners / financing stakeholders / developers

General contractors (EPC) & WP contractors

Webinar 4: Results from IEA-ES Task 45 studies/work (+ potential information desires/wishes from stakeholders)

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# Planned Webinars and Q&A Sessions

| Year | 2025 | | | | | | | | | | | | 2026 | | | | | | | | | | | | 2027 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Webinar | | | | | | 1 | | | | | | 2 | | | | | | 3 | | | | | | 4 | | | | | | | | | | | | |
| Q&A Session | | | | | | ✓ | | | 1.1 | | 2.1 | ✓ | 2.2 | 2.2 | 2.3 | | 3.1 | | 3.2 | | 3.3 | | 4.1 | | 4.2 | | 4.3 | | 4.4 | | | | | | | |
| | | | | | | | | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | |

✓ **Webinar 1** Planning, legal & societal aspects of LTES implementation & financial aspects

✓ **Webinar 2** Technical aspects of LTES (feasibility, design, tender, monitoring, etc.) & economic aspects

**Webinar 3** Practical experiences with LTES & economic aspects

**Webinar 4** Results from IEA-ES Task 45 studies/work (+ potential information wishes from stakeholders)

**Q&A Sessions** Depending on questions gathered through an online form

→ https://forms.office.com/e/3826HwsSUw

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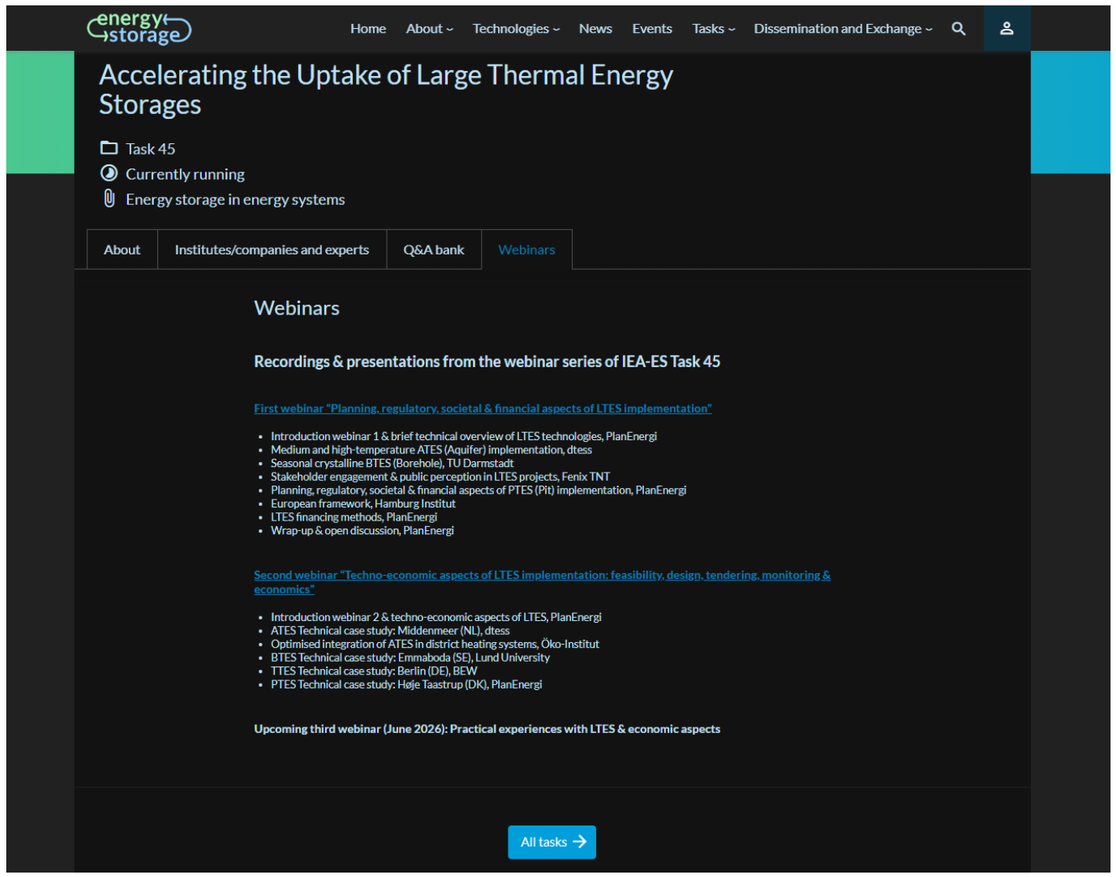
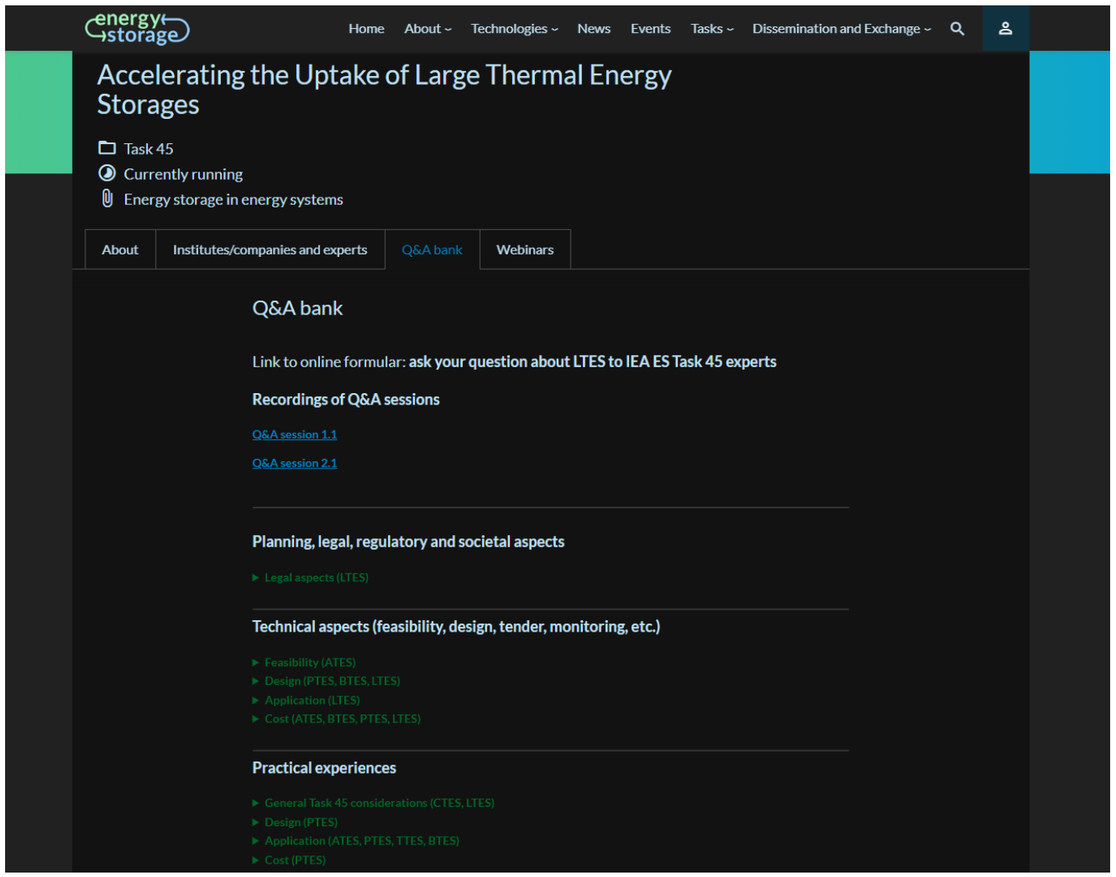
# All content is published

https://iea-es.org/task-45/

## Webinars




## Q&A sessions

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# Webinar 1 program

## Planning, Regulatory, Societal, and Financial Dimensions of Large-Scale Thermal Energy Storage Implementation

| | |
|---|---|
| 9:00 - 9:20 | • Welcome, introduction and brief technical overview of Large Thermal Energy Storage technologies, based on IEA-ES Task 39. *Romain Sucche, PlanEnergi* |
| 9:20 - 9:40 | • Planning, Integration & Regulatory Framework, applied on a Aquifer Thermal Energy Storage case study. *Bas Godschalk, DTESS BV* |
| 9:40 – 10:00 | • Planning, Integration & Regulatory Framework, applied on a Borehole Thermal Energy Storage case study. *Lukas Seib, Technische Universität Darmstadt* |
| 10:00 - 10:10 | • Break |
| 10:10 - 10:30 | • Stakeholder engagement and public perception in an Large Thermal Energy Storage project. *Michal Klauda, Fenix TNT* |
| 10:30 – 10:55 | • Planning, Integration & Regulatory Framework, applied on a Pit Thermal Energy Storage case study. *Per Alex Sørensen, PlanEnergi* |
| 10:55 - 11:15 | • The European Framework for Large Thermal Energy Storage project. *Johanna Schickling, Hamburg Institut* |
| 11:15 – 11:25 | • Break |
| 11:25 - 11:45 | • Large Thermal Energy Storage financing methods. *Geoffroy Gauthier, PlanEnergi* |
| 11:45 - 12:00 | • Wrap-Up & Open Discussion. *Geoffroy Gauthier & Romain Sucche, PlanEnergi* |

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# Webinar 1 highlights: the RED III directive

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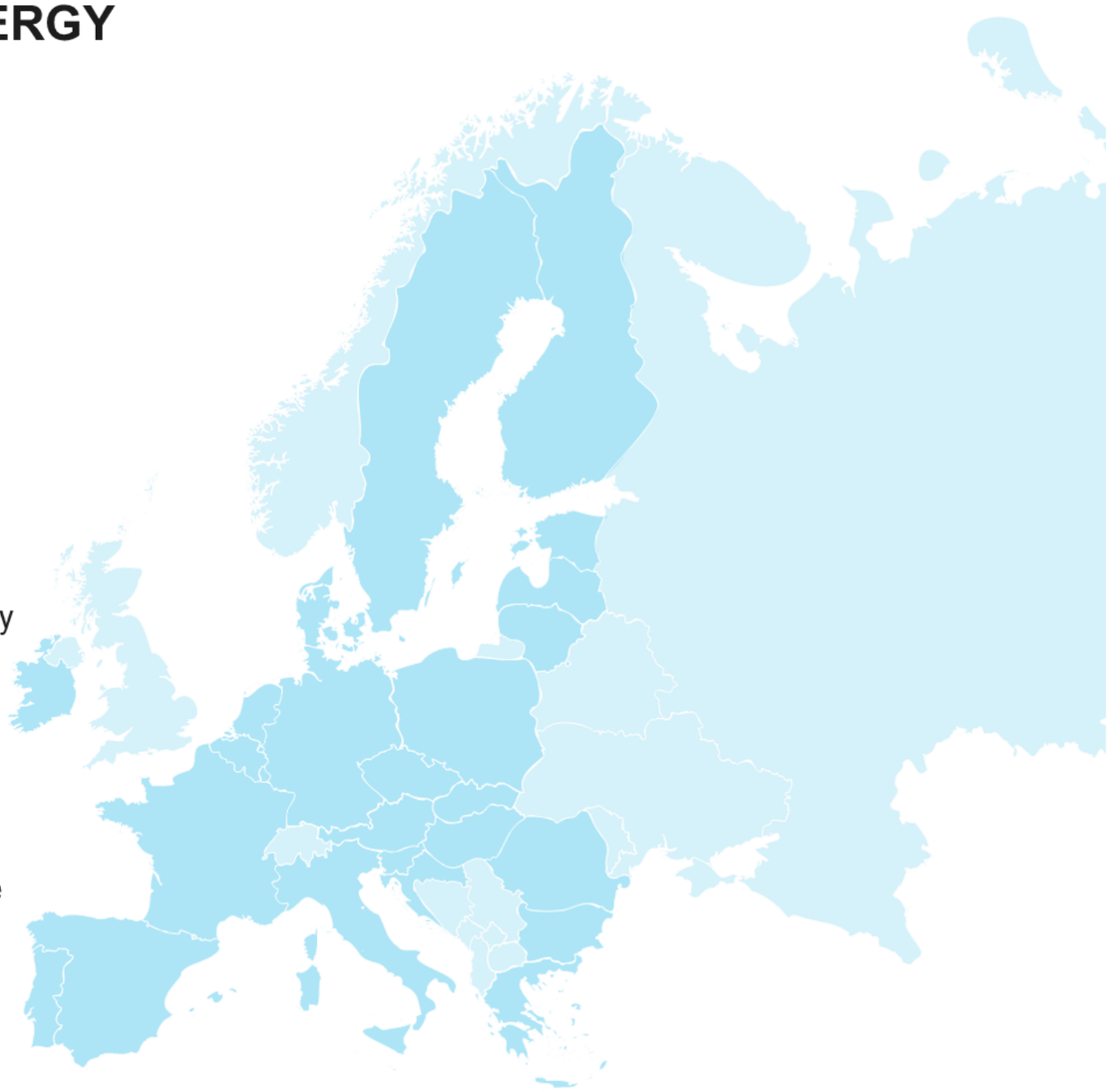
## RED III: EU'S BLUEPRINT FOR RENEWABLE ENERGY

### What is RED III?

- **Directive (EU) 2023/2413 or** 3rd Renewable Energy Directive
- Adopted on 18 October 2023
- Aligns with the European Green Deal and its targets:
  - Climate neutrality by 2050
  - intermediate target of a reduction of net greenhouse gas emissions by at least 55 % compared to 1990 by 2030
  - ensure that the share of renewable energy in the Union's gross final consumption of energy in 2030 is at least **42,5 %**

### Purposes regarding LTES:

- Simplify and shorten permit-granting procedures for renewable energy projects
- thermal storage assets such as LTES included in the term "renewable energy projects"





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# Webinar 1 highlights: the RED III directive

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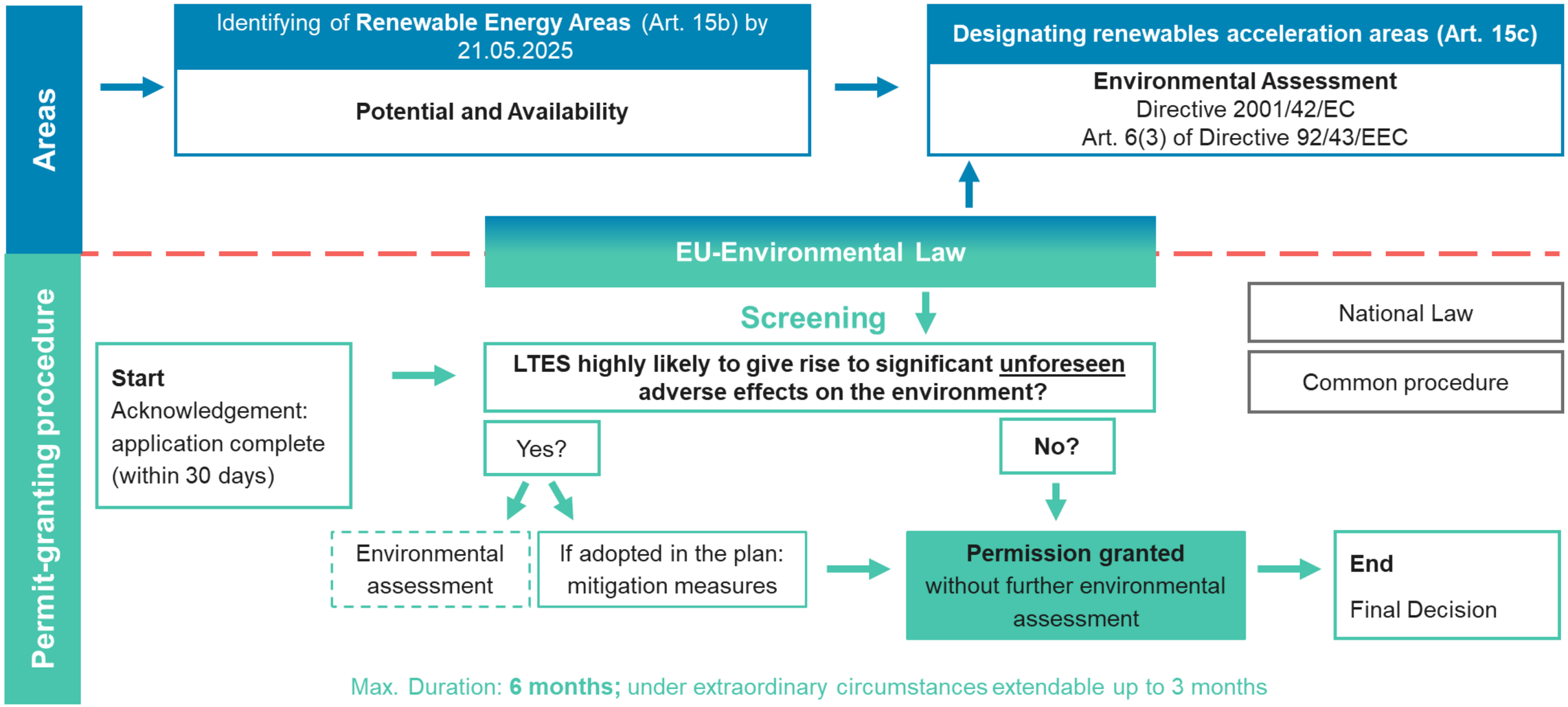
## RED III: RENEWABLES ACCELERATION AREAS




The European Framework for LTES

Recording available at: https://youtu.be/GyxfQkMu_zQ?si=o8Gbsh8yIjWs_CTgt=0s

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# Webinar 1 highlights: the RED III directive

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About | Institutes/companies and experts | Q&A bank | Webinars

## Planning, legal, regulatory and societal aspects

▼ Legal aspects (LTES)

▼ *Is the new revision of the EU Renewable Energy Directive (RED III) expected to reduce the time needed for getting a permit for LTES? If yes, how much?*

The new revision of the EU Renewable Energy Directive (RED III) is designed to significantly shorten permitting times. In areas designated as "renewable acceleration areas," the permitting process should take no more than 12 months, and a maximum of 2 years outside those areas. However, whether it actually speeds up the process depends on how each country implements the directive into national law.

More importantly, the faster permitting rules mostly apply to storage projects that are built together with renewable energy production (such as wind or solar farms) and share a grid connection. For example, in Germany, only wind energy projects currently benefit from the acceleration areas, and thermal energy storage is rarely combined with wind power. This means the practical effect on LTES permitting times, especially for thermal storage, may be limited in some countries.

Additionally, certain types of storage, such as large-scale thermal storage or geothermal systems requiring significant groundwork, may not be covered by these faster permitting rules due to specific exceptions. Therefore, while the directive has the potential to reduce permitting times in theory, the real-world impact for LTES will depend on the specifics of national implementation and storage technology involved.

Answered during Q&A session 2.1 of IEA-ES Task 45, see following link

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Extract from: IEA ES Task 45 Q&A bank

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# Webinar 2 program

## LTES Systems: Technical Feasibility, Design, Tendering, Monitoring & Economic Aspect

| | |
|---|---|
| 9:30 - 9:50 | • Welcome, introduction and brief technical overview of LTES stages and economic order of magnitudes, based on IEA-ES Task 39. *Romain Sucche (PlanEnergi)* |
| 9:50 - 10:15 | • Technical Feasibility, Design, Tendering, Monitoring & Economic Aspect – Applied on a Aquifer Thermal Energy Storage case study: Middenmeer (NL). *Bas Godschalk (DTESS BV)* |
| 10:15 - 10:35 | • Optimised integration of thermal aquifer storage in district heating systems. *Benjamin Köhler (Öko-Institut)* |
| 10:35 - 10:45 | • Break |
| 10:45 – 11:10 | • Technical Feasibility, Design, Tendering, Monitoring & Economic Aspect – Applied on a Borehole Thermal Energy Storage case study: Emmaboda (SE). *Olof Andersson (Lund University)* |
| 11:10 - 11:35 | • Technical Feasibility, Design, Tendering, Monitoring & Economic Aspect – Applied on a Tank Thermal Energy Storage case study: Berlin (DE). *Julian Formhals (BEW Berliner)* |
| 11:35 – 11:45 | • Break |
| 11:45 - 12:10 | • Technical Feasibility, Design, Tendering, Monitoring & Economic Aspect – Applied on a Pit Thermal Energy Storage case study: Høje Taastrup (DK). *Per Alex Sørensen (PlanEnergi)* |
| 12:10 - 12:30 | • Wrap-Up & Open Discussion. *Geoffroy Gauthier (PlanEnergi)* |

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# Webinar 2 highlights: ATES location screening (national level) - opportunity

OptInAquiFer

**RESEARCH PROJECT „OPTINAQUIFER“**

- SHORT INTRODUCTION OF THE PROJECT AND SUB-PROJECTS -

**Geology**

GTN

FAU FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

**Storage Systems**

HAMBURG INSTITUT

**Storages in District Heating**

Öko-Institut e.V.

**Is seasonal heat storage in an aquifer feasible from a geological and technical perspective?**

- Are there storage formations?
- Are they suitable for storage?


**Which concepts are economically feasible?**

- High-temperature application >70°C
- Integration of storage via heat pumps and power storage (TTES)
- Design of reheating/ booster for very high availability (Supply Temperature)

The project was funded by the German Federal Ministry of Research, Technology and Space under the grant number 03G0918A-C.



Extract from presentation by Öko-Institut

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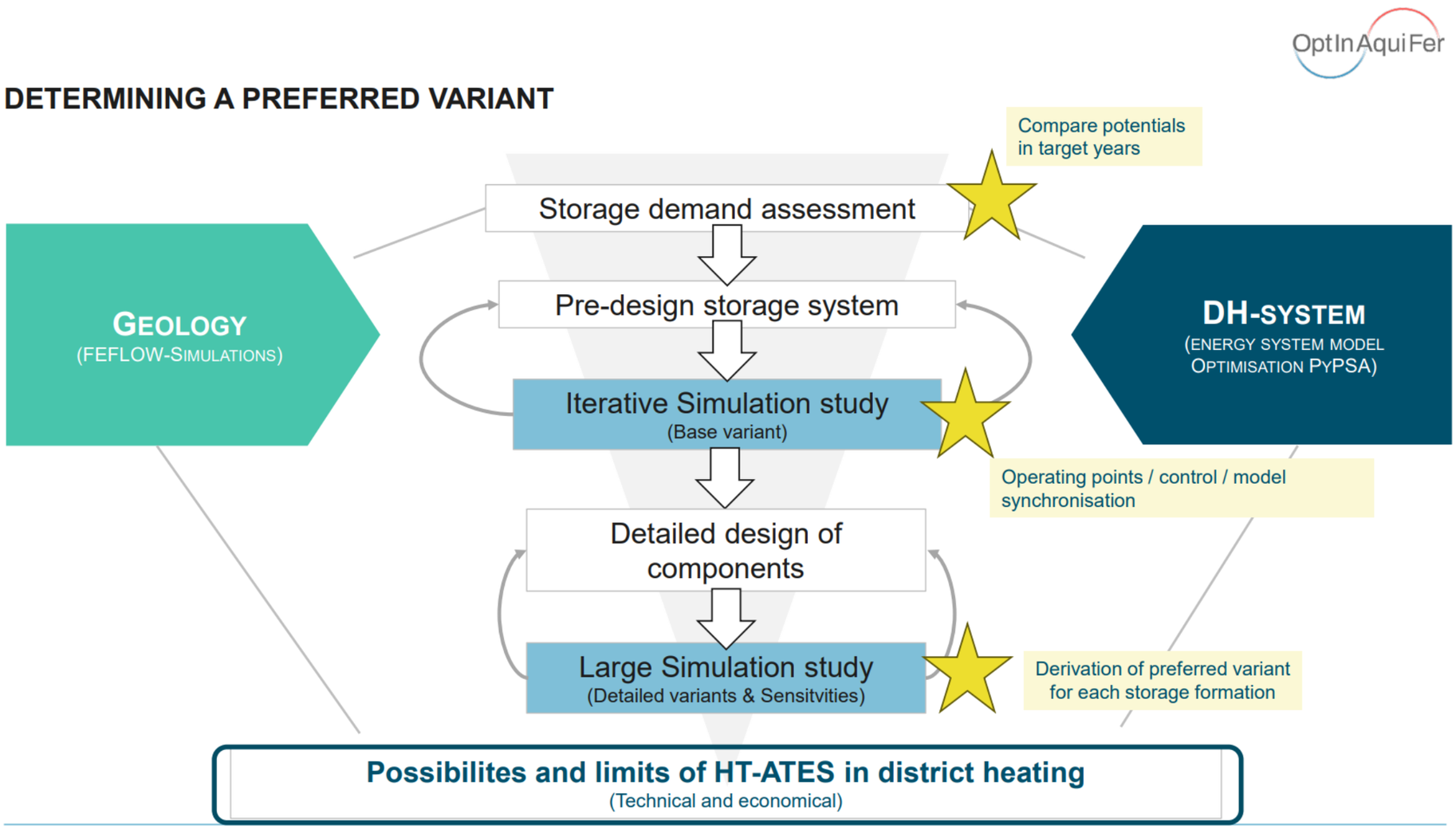
# Webinar 2 highlights: ATES location screening (national level) - opportunity




Extract from presentation by Öko-Institut

Recording available at: https://youtu.be/M6y4EbONeVA?si=nVMeHJr43tca26aTt=0s

# Submit your questions !

- Ask at the end of the presentations (if time permits)

- Or submit your LTES-related questions by filling in this form

  *Questions will be considered during the planned Q&A sessions*

  → https://forms.office.com/e/3826HwsSUw

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# IEA ES Task 45 also closely collaborates with EU-funded LTES projects such as TREASURE (PTES)

TREASURE

Funded by the European Union

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- https://www.treasure-project.eu/
- 7 demonstrators
- 15 satellite initiatives
- Tools, Components
- Methods
- Processes
- 25 Partners, 8 countries
- Other EU-funded LTES projects:
  - Uses4Heat (ATES & BTES) https://www.uses4heat.eu/
  - Interstores (CTES & PTES) https://interstores.eu/

| Demonstrators | Location | Volume of PTES |
|---|---|---|
| 1 | Rostock | 500.000 |
| 2 | Pau | 340.000 |
| 3 | Pancevo | 150.000 |
| 4 | Bytom | 90.000 |
| 5 | Wien | 40.000 |
| 6 | Choszczno | 30.000 |
| 7 | Hechingen | 18.000 |

| Monitoring | | |
|---|---|---|
| 1 | Høje Taastrup | 70.000 |
| 2 | Lidzbark Warminski | 15.000 |

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# Thanks for your attention !

Learn more at https://iea-es.org/task-45/

Geoffroy Gauthier, gg@planenergi.dk

Danish participation to IEA ES Task 45 receives financial support from: EUDP

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