



# 1st EnerTEF tutorial

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## Metadata

**Title:** Introductory material on the TEFs structure and configuration

**Primary Audience:** Stakeholders interested in AI for energy and sustainability, including:

- SMEs & Startups
- Public Sector & Energy Authorities
- Industry & Corporates
- Innovation Ecosystem Actors



Attribute	Profile
Tech Level	Intermediate (non-academic, not deep research)
Familiarity with TEF	Likely low or first-time exposure
Interest	Practical: What is it? How can I use it? Who pays?
Preferred Format	Clear visuals, use cases, concise language

## Metadata

**Title:** By the end of this session, participants will be able to:

- Explain what a TEF is and describe EnerTEF's unique role in the AI and energy ecosystem.
- Identify the types of services offered by EnerTEF and how they support AI testing.
- Understand how stakeholders can engage with EnerTEF through services, pilots, or collaboration.
- Identify how to access EnerTEF services and initiate collaboration.

**Duration:** 6–7 minutes

**Assessment:** Optional Self-Assessment Quiz



## What is a TEF Technically

**A TEF (Testing and Experimentation Facility) is a combination of:**

- Physical labs
- Software/simulation platforms
- Validation tools
- Infrastructure for real-world AI testing

### **Federated model:**

TEFs across Europe are interoperable and connected — sharing:

- Standards
- Interfaces
- Resources



### **Key technical features:**

- Scalability: test small to large-scale scenarios
- Security: supports trustworthy AI
- Cross-node collaboration: nodes offer complementary capabilities

## What is a Service in TEF?

A “**service**” is a concrete capability provided to stakeholders via the TEF.

- It can be technical, digital, physical, or regulatory.
- Think of it as something you can request, use, and evaluate.

### Types of services offered in EnerTEF:

- Physical: Lab access, equipment testing, smart grid environments.
- Digital: Simulation tools, digital twins, synthetic data environments.
- Regulatory: Ethical/legal validation, conformity assessment for AI systems.

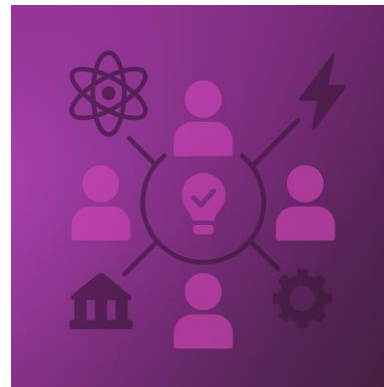
**Example** use case: A startup developing an AI algorithm to forecast energy demand can:

- Upload their model to a secure TEF environment.
- Test it against real or simulated grid data.
- Receive performance metrics, bias analysis, or compliance feedback.



## Groups Engaged

EnerTEF is not just about technology; it's about connections. We bridge the gap between AI developers and major energy players, enabling **SMEs** and **start-ups** to collaborate directly with **end users**, gain critical feedback, and accelerate time-to-market. If you're ready to move beyond pilots and prototypes, EnerTEF offers the environment and network to make it happen.



## Why EnerTEF? Why Now?

AI innovation often stalls at the testing phase due to lack of infrastructure and standardized validation.

EnerTEF is a Horizon Europe-funded Testing and Experimentation Facility (TEF) focusing on energy and sustainability. Federated network of nodes across Europe provides shared services, labs, and testing platforms to support AI development.



## Energy & Sustainability Focus

EnerTEF is tailored for **energy-sector** AI applications, supporting innovation in:

- Smart grids
- Demand forecasting
- Renewable integration
- Energy efficiency optimization

**Sustainability** is central to EnerTEF's mission:

- Helps AI developers evaluate carbon impact, energy use, and resilience.
- Enables the design of greener, smarter, and safer energy systems.

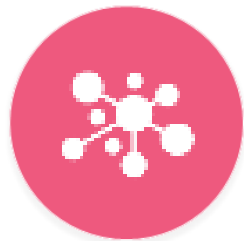


Technical **challenges** addressed:

- Fragmented and noisy energy data
- Real-time AI decision-making under uncertainty
- Deployment at the edge (e.g. embedded AI in energy devices)

## Primary Goal

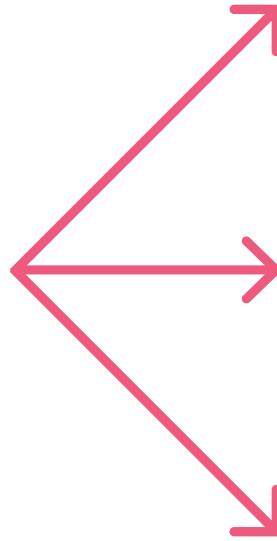
Establish a Common European-scale Energy Artificial Intelligence (AI) Federated Testing and Experimentation Facility (TEF), facilitating extensive adaptation, validation, and upscale of AI tools and services across the energy sector.



5 Nodes



3 Satellites



Testing AI Services



Trustworthy AI



Real-World  
Environments

## What Stakeholders Gain

Easy access to cutting-edge facilities:

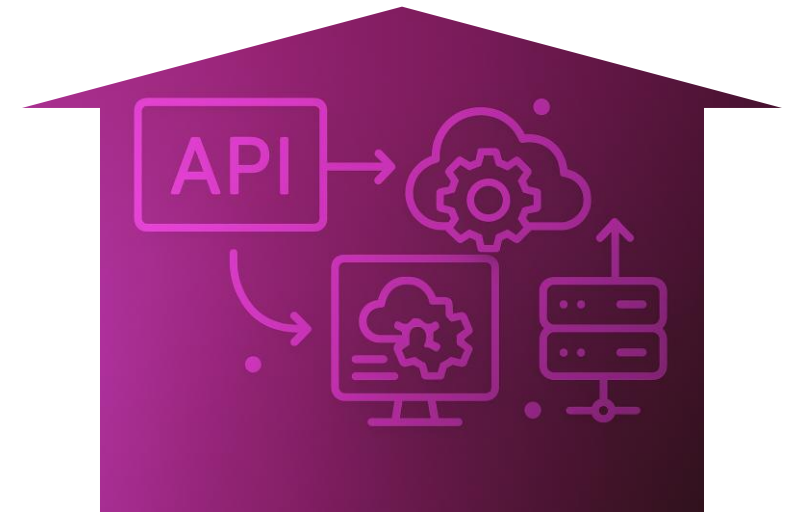
- Via APIs, remote platforms, or direct lab engagement.
- SMEs and startups don't need to build their own infrastructure.

Compliance & validation support:

- Help with regulatory, ethical, and legal frameworks (e.g., AI Act).
- Simplifies the path to market for energy-related AI products.

Test-before-invest model:

- Real-world environments to validate AI systems before deployment.
- Reduces financial and reputational risk for innovators.



Federated benefits:

- Access to a pan-European network of services, not just one node.
- Encourages collaboration and scalability across regions and sectors.

## Call to Action & What's Next

This is just the beginning:

- More tutorials will follow — each one focused on a specific EnerTEF service.
- Learn how to access, use, and benefit from individual testing capabilities.

### Get involved:

- Join pilot projects or testing campaigns.
- Request a service or propose a collaboration.

We're here to support you:

- EnerTEF experts are available to help tailor testing setups.



## Indicative Use Case

### Short narrative:

A startup developing an AI for smart building energy optimization wants to use EnerTEF to test their model on a simulated microgrid.

### Outcome:

Within 10 days, they will detailed performance metrics and a compliance readiness report – without needing physical hardware.



## How to find more about EnerTEF Services

Access flow:

- Visit the EnerTEF website
- Browse available services
- Submit a service request or join a pilot

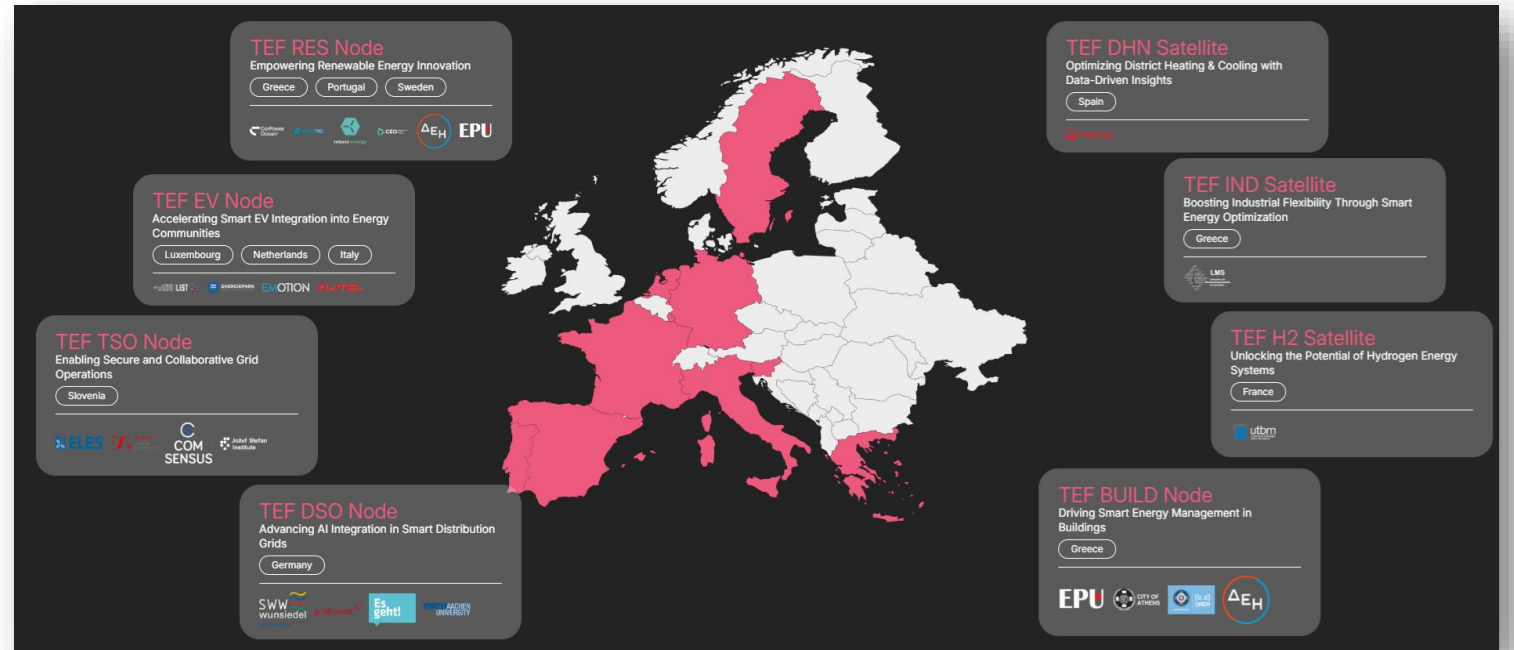


<https://enertef.eu/services-catalogue>

## Connect with Us

Website URL: [enertef.eu](http://enertef.eu)

Contact: [info@enertef.eu](mailto:info@enertef.eu)



## Optional Evaluation - Self-Assessment

**Reflect on each question. Can you confidently answer it in your own words?**

### Core Concepts

- What is a TEF, and why has the European Commission funded them?(Hint: Think about the testing gap in AI development.)
- What makes EnerTEF different from other TEFs?(Hint: Which sector does it focus on?)
- What does it mean that EnerTEF is "federated"?(Hint: Think about nodes, interoperability, shared infrastructure.)

### Services & Use Cases

- What types of services does EnerTEF offer?(Hint: There are three main types — physical, digital, and...)
- Can you give a simple example of how a startup might use EnerTEF?(Hint: Forecasting, simulation, compliance, etc.)

### Energy & Impact

- Why is energy and sustainability an important focus for AI testing?(Hint: What kind of challenges and KPIs are involved?)
- What role does EnerTEF play in helping solutions become greener or more efficient?

### Involvement

- What are some ways stakeholders can engage with EnerTEF today?(Hint: Think pilot projects, tutorials, matchmaking...)
- What is meant by “test-before-invest” in the TEF context?Who benefits from EnerTEF — and how?

What is one real-world example of how EnerTEF services were used?(Hint: AI for buildings, forecasting, etc.)

What are the steps to access EnerTEF services?How can you stay informed or join a pilot project?



*If you struggled with any question above, go back to that section of the slides – or reach out to a TEF contact point for follow-up!*





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# Thank You!



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