

Tri-HOST™

**Tri-Generation Hybrid
Orchestrated Solar Technology.**

***A Hybrid Solar Platform for Dispatchable
Renewable Heat, Power & Thermal Storage***

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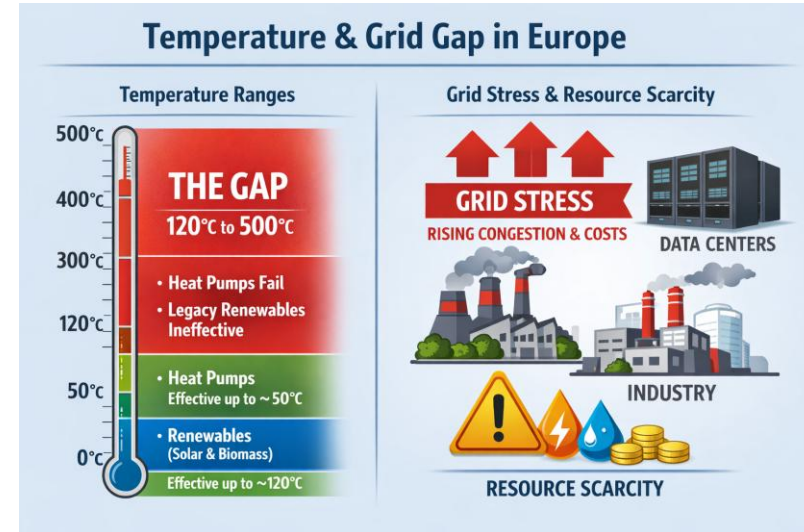
Why RE-HEAT? Europe's Strategic Opportunity

The Challenge

- **Industrial Heat:** Nearly **50% of Europe's final energy demand** is heat, yet most industrial process heat still relies on fossil fuels.
- **Grid Integrity:** Rapid electrification is placing increasing pressure on electricity networks. Grid constraints, curtailment, and rising connection costs are becoming major barriers to industrial decarbonization.
- **Green Hydrogen:** Large-scale hydrogen production requires abundant, low-cost renewable electricity together with medium- to high-temperature thermal energy to improve efficiency and reduce production costs.
- **AI & Data Centers:** The rapid expansion of AI and hyperscale data centers is driving unprecedented demand for reliable electricity, efficient cooling, and innovative waste-heat recovery solutions.

The Opportunity

Europe needs integrated energy platforms that simultaneously deliver renewable electricity, dispatchable thermal energy, thermal storage, and sector coupling for industry, hydrogen production, district energy, and next-generation digital infrastructure.

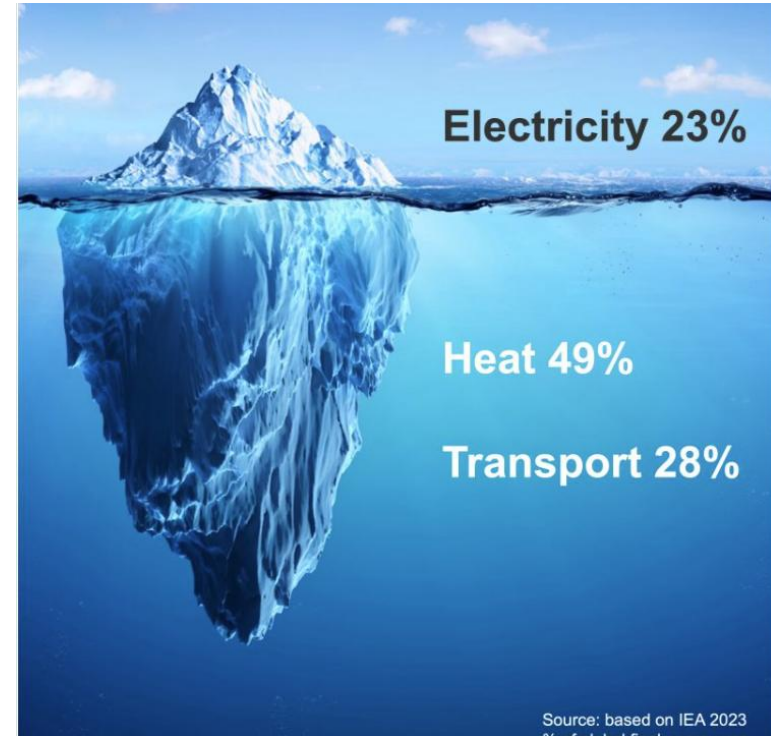


Heat: The Next Frontier of the Energy Transition

Energy isn't just electricity. Many countries have done well to decarbonise the tip of the energy iceberg - electricity. The hard bit is what's below the tip of the iceberg - heat, cooling and transport.

Thermal energy accounts for nearly half of final energy demand—making thermal energy the decisive frontier of the Energy Transition.

- **PV-alone cannot address heat, hydrogen, or cooling at scale**
- **Grid limitations to integrate >25% of fluctuating power from variable renewables**
- **Green hydrogen for hard-to-abate**

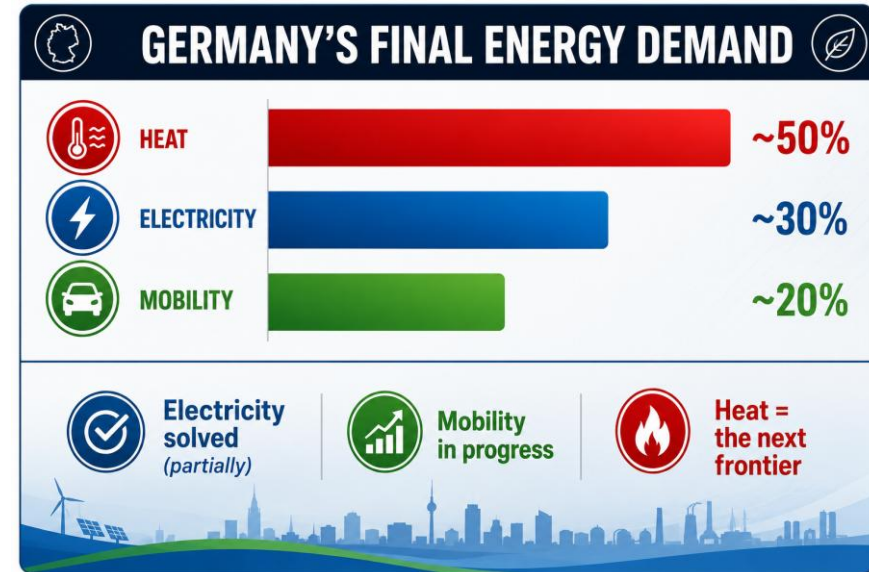


Germany's Heat Transition (Wärmewende 2045)

The Gap:

- Renewable electricity deployment has accelerated
- Industrial heat and district heating remain dependent on fossil fuels
- Dispatchable renewable heat is the missing piece

National funding programs are prioritizing industrial heat decarbonization, district heating expansion, large-scale thermal energy storage, renewable heat technologies and electrification to achieve climate neutrality by 2045.



That is placing thermodynamics at the heart of the energy transition.

Industrial Heat Challenge

- Industrial heat spans a wide temperature spectrum.
 - No single technology fits every application.
 - Thermodynamics enables optimal decarbonization pathways.
 - Low-temperature process heat (80–250°C), the largest share, offers immediate deployment opportunities.
 - Difficult to decarbonize through electrification alone
 - Ideal for TES and renewable heat integration
- **Beyond combustion lies the heat transition.**
- **Every temperature demands tailored thermodynamic solutions.**
- **Innovation enables industrial-scale decarbonization.**

Decarbonizing Industrial Heat Across All Temperature Levels

Industrial Heat Demand and Decarbonization Pathways <i>From Low-Temperature Heat to High-Temperature Processes</i>		
SECTOR	TEMPERATURE RANGE	DECARBONIZATION OPTIONS
 Food Processing	80–150°C	 Heat pumps, solar thermal
 Brewing	100–150°C	 Heat pumps, thermal storage
 Paper	120–200°C	 Solar thermal, biomass
 Chemicals	150–300°C	 Hydrogen, electrification
 Steel	> 500°C	 Hydrogen, electric arc
 Cement	> 1000°C	 Hydrogen, alternative fuels

Tri-HOST™ – Integrated Climate-Neutral Energy Platform

An integrated solar platform delivering renewable heat, electricity, thermal storage and sector coupling from a single modular architecture

Core Technology Integration: Tri-HOST™ combines four technologies into one integrated platform:

◆ Hassabou Collector™

- Hybrid PV-T collector
- Electricity + medium-temperature heat
- Up to ~130°C today
- Modular and scalable

◆ Integrated Thermal Storage

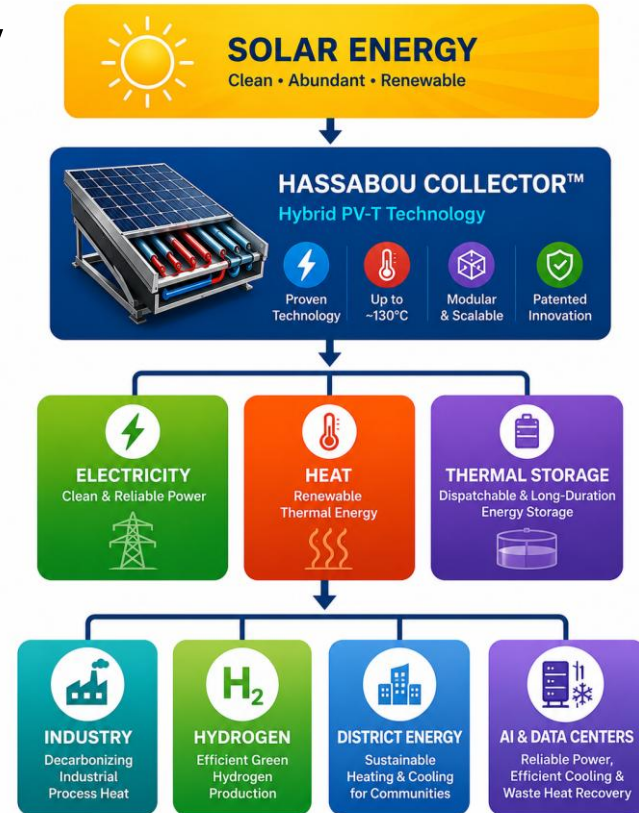
- Dispatchable renewable heat
- Grid flexibility
- Long-duration thermal energy storage

● Multi-Sector Integration

- Industrial process heat
- District heating
- Green hydrogen
- AI & Data Centers

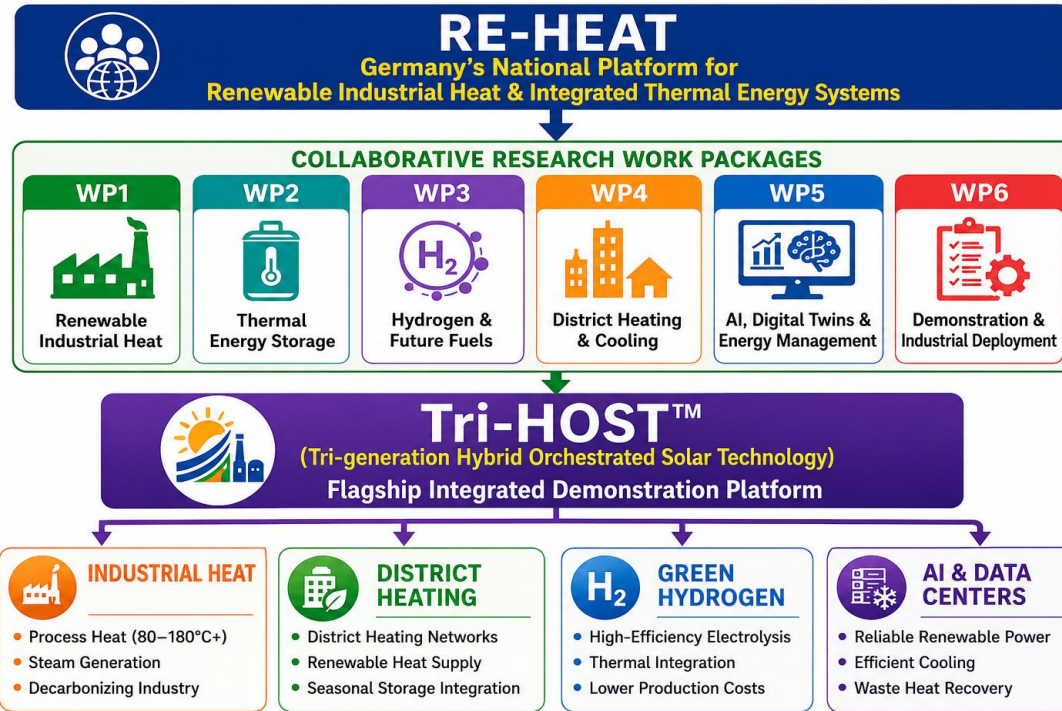
● Intelligent Energy Management

- AI-ready control architecture
- Digital Twin integration
- Multi-energy optimization



RE-HEAT Research Platform

RE-HEAT Platform Architecture



◆ What is Tri-HOST™?

Tri-HOST™ (Tri-Generation Hybrid Orchestrated Solar Technology) is the flagship integrated technology platform within RE-HEAT. It combines renewable electricity, renewable heat, thermal energy storage, and intelligent energy management to enable large-scale demonstration and industrial deployment.

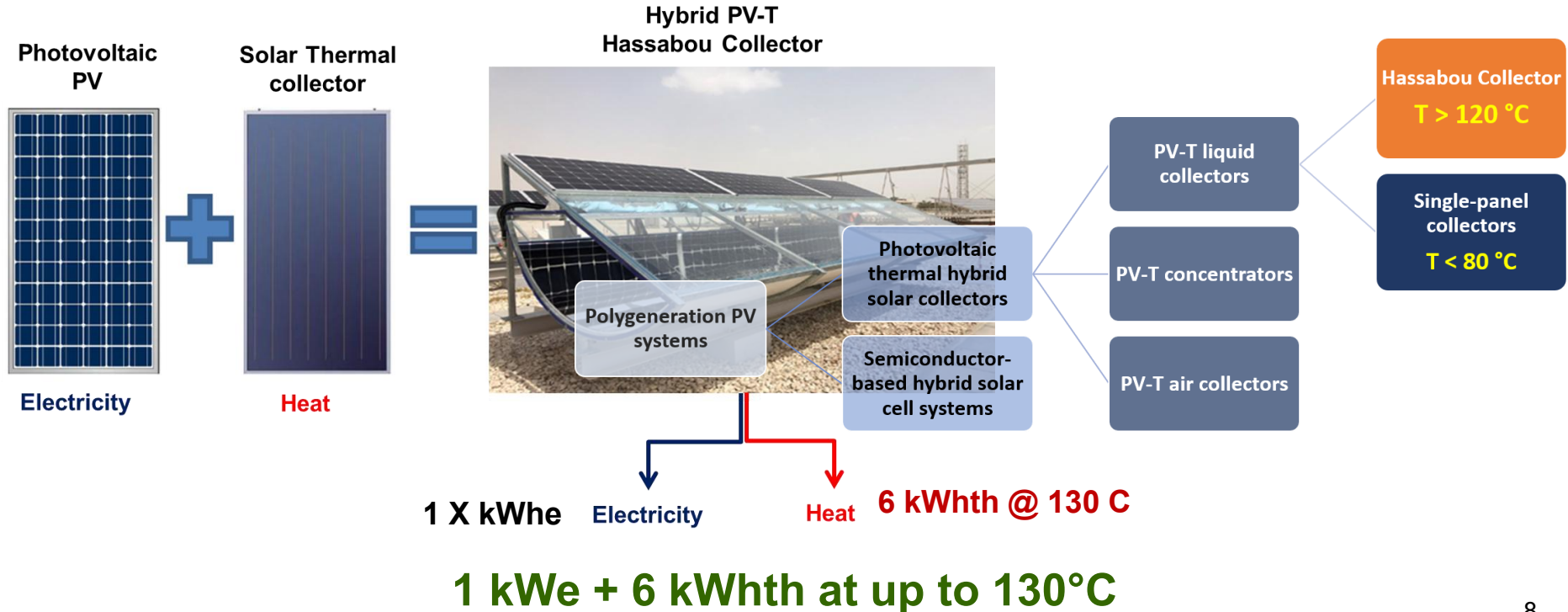
◆ What is RE-HEAT?

RE-HEAT is a collaborative national research and innovation platform that brings together academia, industry, municipalities, and funding organizations to accelerate the decarbonization of industrial heat and integrated thermal energy systems.

RE-HEAT defines the collaborative platform. Tri-HOST™ provides RE-HEAT's first flagship technology platform and demonstrator. Together they bridge research, demonstration, and industrial deployment.

HASSABOU COLLECTOR

Innovative Hybrid Solar Photovoltaic Thermal PV-T Collector



Independent Validation & Technology Readiness

From scientific innovation to industrial deployment



**Research
Demonstrator –
Qatar Foundation**

Intellectual Property

- ✓ Multiple patented technologies
- ✓ International patent portfolio
- ✓ Strong foundation for TUM deep-tech venture

Technology validated. Strong foundation for industrial demonstration and commercialization.



Independent Technical Assessment by Fichtner GmbH & Co. KG (2025)

- ✓ Technically feasible
- ✓ Hybrid PV-T concept based on sound thermodynamic principles
- ✓ Delivers renewable heat up to 130°C
- ✓ Thermal output approximately 5–6× electrical output

Commercial Deployment Pathways

The Opportunity

Europe is investing hundreds of billions of euros to decarbonize industry, energy infrastructure, and critical technologies.

Tri-HOST™ platform enables solutions across four rapidly growing markets:

Renewable Industrial Heat

- Decarbonization of industrial process heat
- Medium-temperature applications
- Replacement of fossil fuels

Green Hydrogen

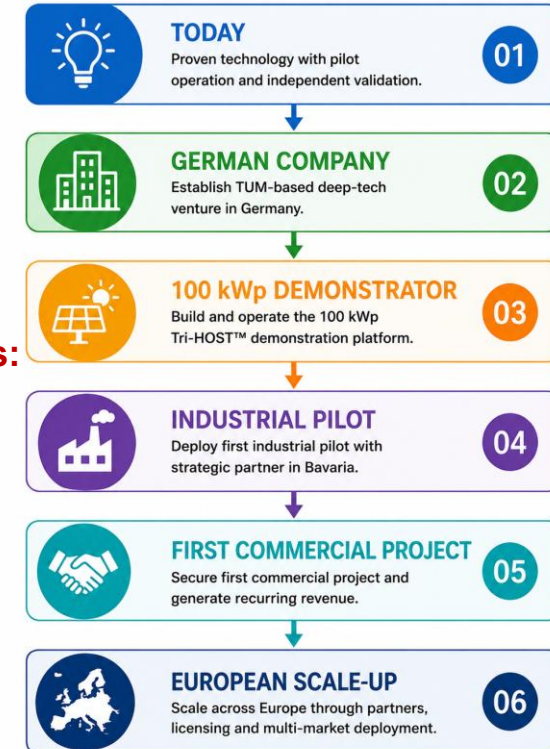
- Renewable electricity + thermal integration
- Higher electrolyzer efficiency
- Lower hydrogen production cost

Grid Flexibility

- Dispatchable renewable energy
- Thermal storage
- Reduced grid congestion

AI & Data Centers

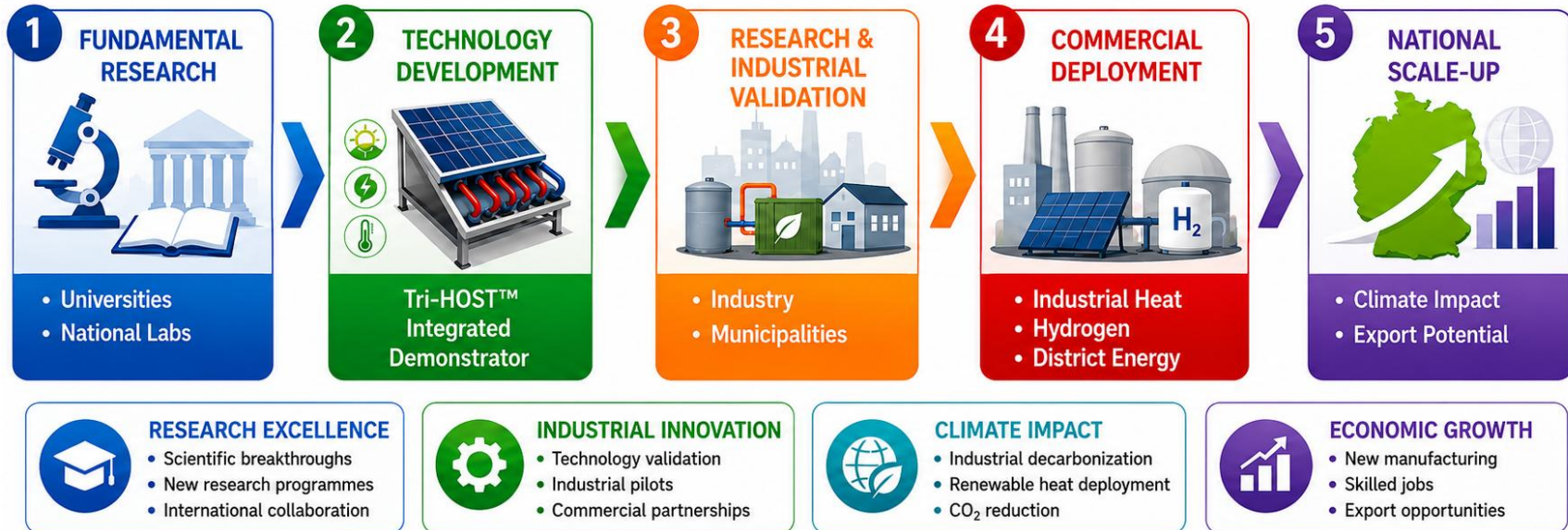
- Renewable power
- Sustainable cooling
- Waste heat recovery



Tri-HOST provides a scalable architecture integrating renewable heat, electricity, thermal storage and sector coupling to accelerate Europe's energy transition.

Tri-HOST Commercialization Roadmap

From Research Excellence to Industrial Deployment and National Scale-Up



RE-HEAT provides the collaborative pathway that transforms scientific innovation into large-scale industrial deployment and long-term societal impact.

Together, we can establish Tir-HOST as Germany's flagship technology and industrial validation platform for renewable industrial heat.

We look forward to working together

Thank You

