

The Solar Isle's Challenge

Decarbonising Cyprus's Heating
and Cooling Sector.



A Highly Vulnerable Baseline

85%

In 2023, imported oil and petroleum products accounted for 85% of Cyprus's total energy supply. This overwhelming dependency creates profound energy security vulnerabilities and exposure to volatile global markets.

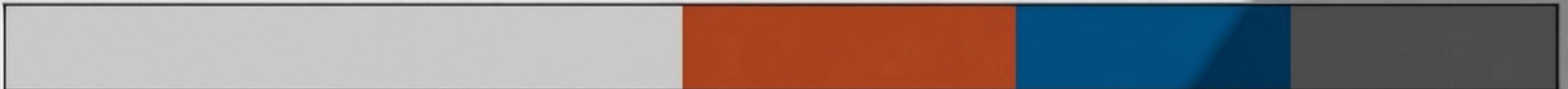
Final Energy Consumption

Transport (42.3%)

Residential (20.1%)

Commercial/Public (15.8%)

Industry (15.7%)



The Climate Outlier: A Cooling-Dominated Grid



The Winter Reality

Space heating accounts for only 33.5% of residential energy use (compared to the EU average of 62.5%). Yet, 60.3% of this heating energy is derived from highly polluting petroleum products.

The Summer Strain

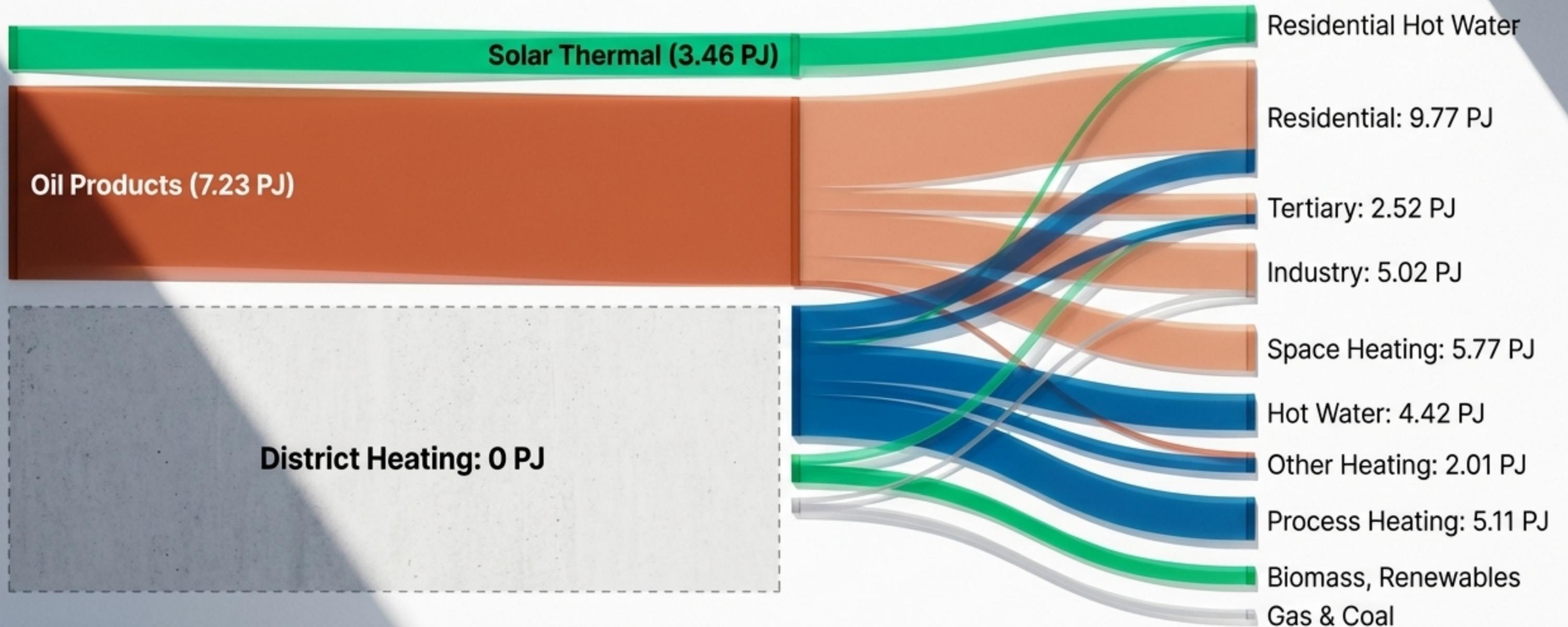
The primary thermal comfort challenge is cooling. Supplied almost entirely by electricity, this demand places massive strain on the power grid during peak summer months.

The Historical Success

A stark contrast—Cyprus is a global leader in solar water heating, with an estimated 93.5% of households utilizing rooftop solar thermal systems, achieving 81.1% renewable penetration.

Mapping the Flow: A Decentralised Reality

Unlike continental systems, thermal energy in Cyprus is delivered entirely through decentralised, individual systems. There is no district heating infrastructure to leverage.



The Blueprint vs. The Reality

Standard EU Blueprint		The Cypriot Reality	
Primary Demand	Heating & Winter Peaks	Primary Demand	Cooling & Summer Grid Strain
Infrastructure	Networked District Heating	Infrastructure	INTER Regular 100% Decentralised Individual Systems
Waste Heat Profile	Strategic Resource from Heavy Industry	Waste Heat Profile	INTER Regular Negligible Point Sources in a Service Economy
Policy Readiness	Established Local Planning	Policy Readiness	No Legal Framework

Standard infrastructure grants and network-based DHC models will fail in Cyprus due to low heat density and systemic technological lock-in.

The Waste Heat Myth: A Mismatch of Scale

A cornerstone of European decarbonisation is the capture of industrial waste heat. In Cyprus, a service-based economy, the industrial sector is small (15.7% of final energy consumption).

**National
Thermal Demand
(27.1 PJ)**

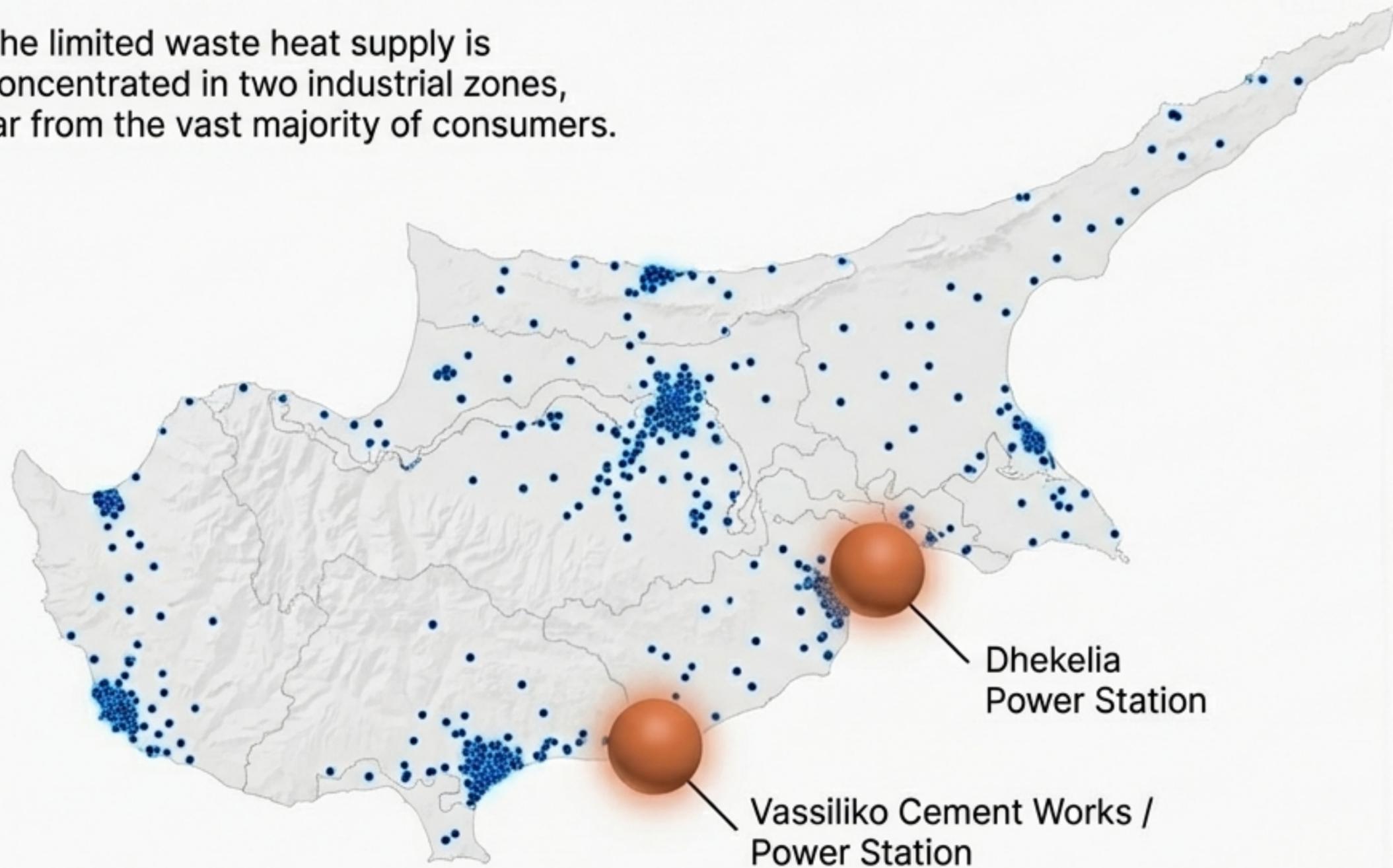
14.4 PJ Residential
+ 12.7 PJ Commercial

**Max Recoverable
Industrial Waste Heat
(3.8–5.0 PJ)**

Even if an optimistic 30-40% of industrial energy input from point sources (like cement kilns) is recovered, the total potential remains a mere fraction of the dispersed national demand.

The Missing Integration Vector

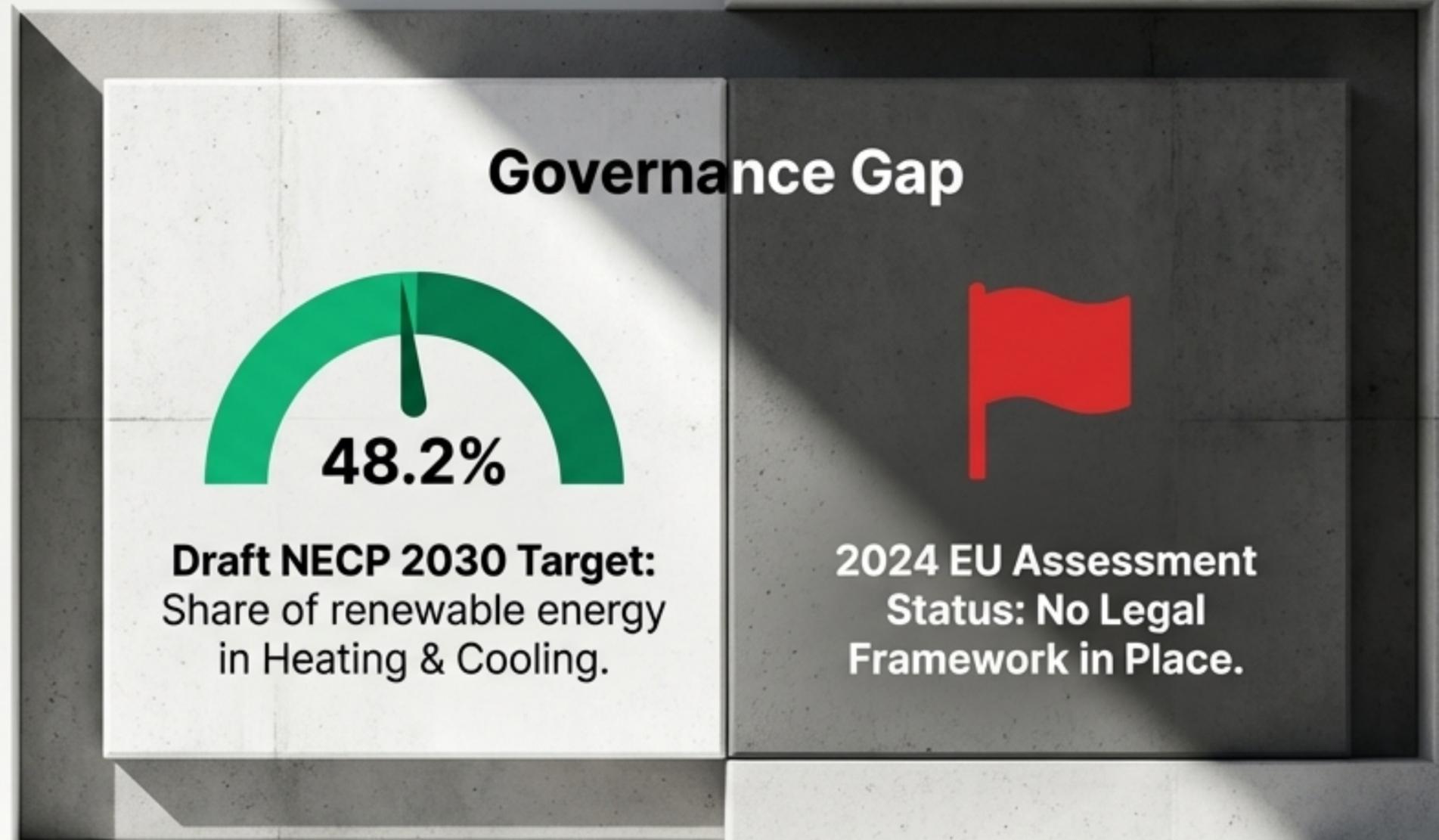
The limited waste heat supply is concentrated in two industrial zones, far from the vast majority of consumers.



With absolutely no District Heating and Cooling (DHC) networks in existence, transporting heat from Vassiliko or Dhekelia would require building kilometers of pipeline from scratch. Given low winter utilization, this infrastructure is economically unviable.

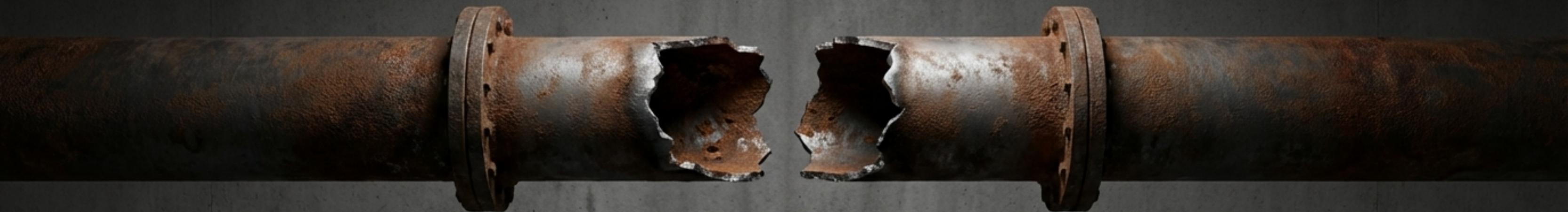
The Policy Vacuum

The EU's Recast Energy Efficiency Directive (Article 25.6) mandates the creation of local heating and cooling plans in all municipalities over 45,000 residents by September 2025.



Without a structured, legally binding planning process, transitioning a decentralized, fossil-dependent system to meet ambitious 2030 targets is structurally impossible.

The Dead End & The Open Door



Because we cannot economically move heat across the island via networks, we must master it within the walls of every individual building.

Industrial waste heat and district networks represent a strategic dead-end for Cyprus. The future of thermal comfort is building-centric, electric, and solar-powered.



The Decentralised Roadmap: A Three-Pronged Strategy

Prong 1: Deep Renovation

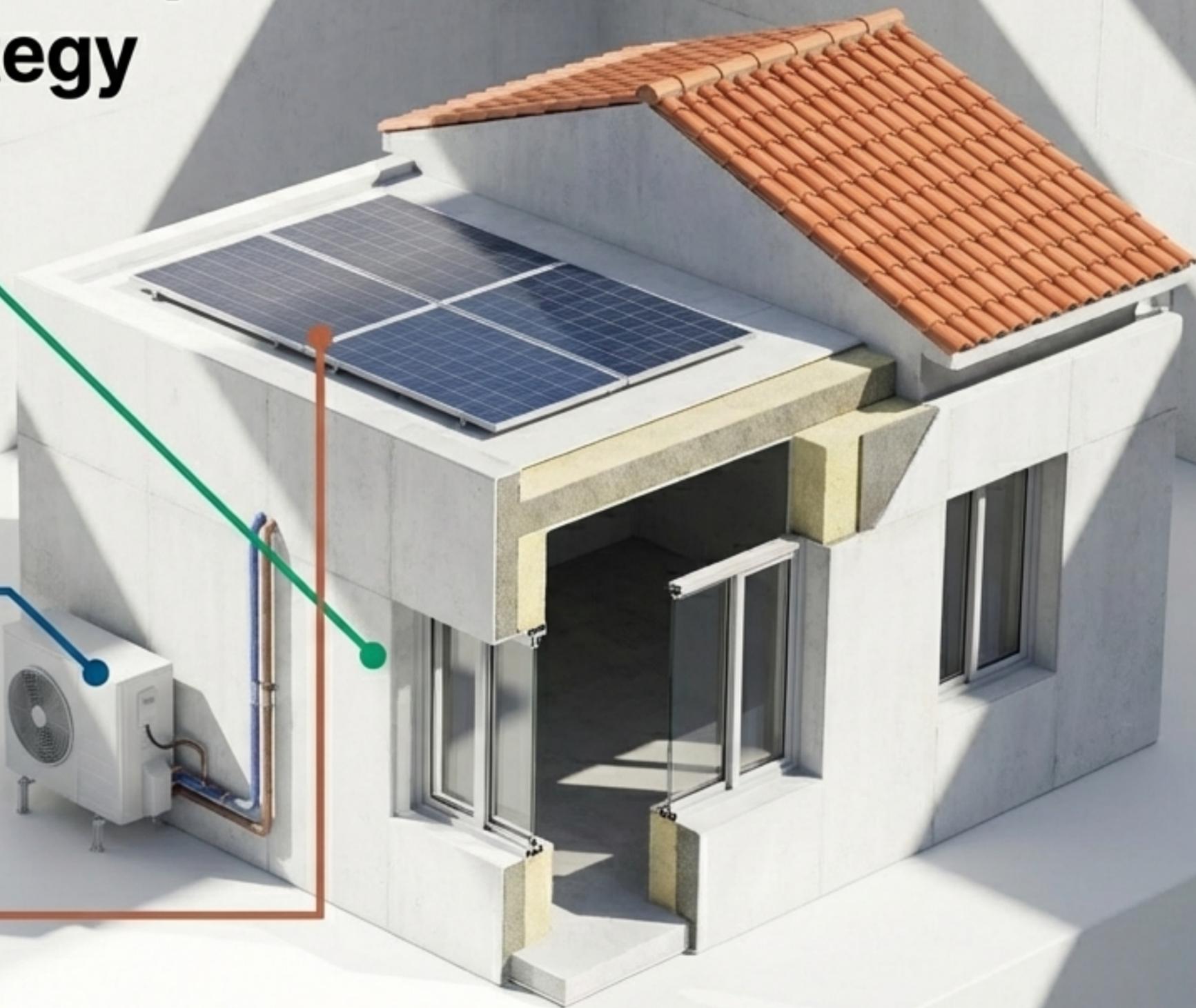
Upgrading thermal envelopes to drastically cut fundamental heating and cooling demand.

Prong 2: Systemic Electrification

Replacing oil boilers and legacy AC units with high-efficiency heat pumps.

Prong 3: Solar & Grid Integration

Powering electrified thermal comfort with decentralized, clean solar energy.





Activating the Strategy: Policy & Power

Point 1: Decarbonising the Grid (The Prerequisite)

As of 2023, 80% of Cyprus's electricity is still generated from oil. Electrifying heating and cooling via heat pumps is only truly sustainable if the power source is green. Rapid deployment of utility-scale and rooftop solar PV, paired with energy storage, is a prerequisite.

Point 2: Empowering Municipalities (The Mandate)

The government must urgently transpose the EU's EED to establish a national heat planning framework.

Municipalities require data-driven heat atlases to identify priority areas for deep renovation and orchestrate the localized rollout of new thermal technologies.



From Vulnerability to Benchmark

Cyprus's path to a decarbonised thermal sector will not be paved with district heating pipes. By embracing its unique geography, leveraging its world-class solar resources, and driving a relentless building-by-building transformation, Cyprus can transition from total fossil-fuel dependency into Europe's benchmark for resilient, decentralised thermal comfort.