

SHURA AGENDA

Heat Pumps



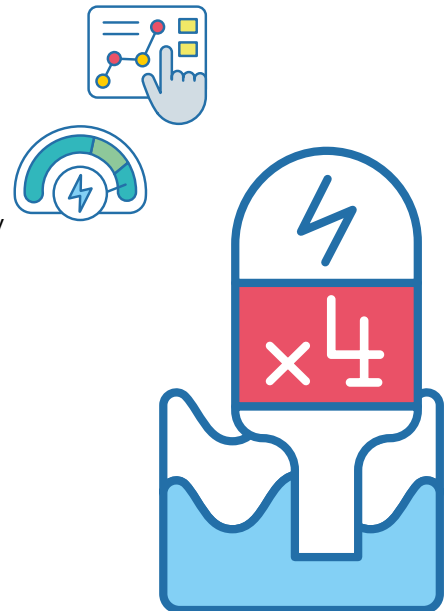
Energy efficiency is as vital as the use of renewable energy sources in the energy transition. Key developments in 2024 emphasize the synergy between decarbonization and energy efficiency, highlighted by the launch of the Energy and Carbon Reduction Support Program (“EKA”).

The first issue of SHURA AGENDA is dedicated to heat pumps, which significantly contribute to energy efficiency and decarbonization and are increasingly used in buildings, especially across Europe.

Generates four times as much heat as total power input

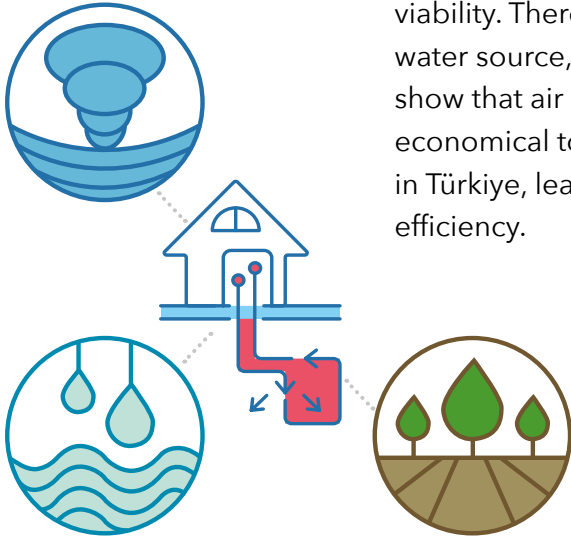
Heat pumps convert ambient natural heat into high temperature and pressure for heating, cooling, and hot water. They substantially support decarbonization by using electricity instead of fossil fuels like coal or natural gas. As the share of renewables in electricity generation grows, their impact increases. In Türkiye, 45% of electricity is generated from renewable sources. If heat pumps are powered by rooftop solar panels, this share can reach 100%.

Compared to other heating and cooling systems, heat pumps operate with higher efficiency while reducing overall energy demand. The Coefficient of Performance (COP), which measures the ratio of total heating capacity to total power input, ranges from 1.5 to 4 for heat pumps, whereas natural gas boilers have a COP around 0.9. This means heat pumps can produce 1.5 to 4 times more heat energy than their power input, while fossil fuels typically experience losses resulting in less heat energy than the energy input.

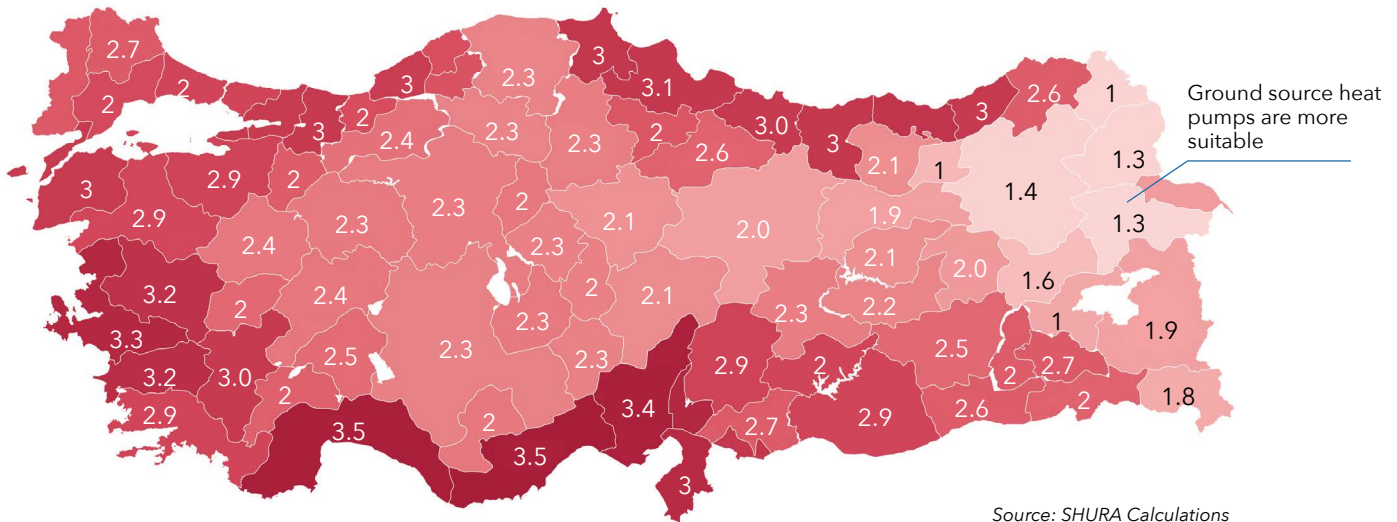


Heat pumps are suitable for most regions of Türkiye

Based on COP values, Türkiye, particularly its coastal regions, has significant potential for heat pump adoption. Higher COP values indicate greater efficiency and economic viability. There are three types of heat pumps: air source, water source, and ground source. SHURA's calculations show that air source heat pumps, which are easier and more economical to implement, have an average COP of 2.75 in Türkiye, leading to a 64% improvement in final energy efficiency.



Average COP (Coefficient of Performance) Values for Air Source Heat Pumps in Türkiye



Offers significant benefits when combined with solar energy

Heat pumps, especially when paired with solar energy systems in detached houses and new buildings, provide a clean, efficient solution for heating and cooling, reducing monthly energy bills. ***When powered by rooftop solar systems, heat pumps remain cost-competitive even against subsidized natural gas tariffs.*** However, the broader adoption of heat pumps in grid-connected homes requires policy adjustments to close the gap between natural gas and electricity tariffs in favour of electricity.



What steps can be taken to promote the widespread use of efficient and eco-friendly heat pumps?

Here are SHURA's recommendations:

- The new electricity tariff to be implemented in 2025 will largely remove the subsidies for users exceeding a certain consumption level, while natural gas subsidies remain. Aligning or removing these subsidies would make heat pumps more attractive.
- If the current tariff structure persists, exempting heat pump users from the higher electricity tariff (high tier) or providing cash rebates could encourage adoption.
- Grants, loans, tax incentives, publicity, and awareness campaigns –similar to those in Europe– should be introduced to promote heat pump usage.
- Introducing annual net metering with the grid, instead of monthly settlement, could serve as an incentive for residences with rooftop solar panels and heat pumps.
- Mandating the use of heat pumps in new buildings, particularly in regions with high COP values, could accelerate adoption.
- Revising natural gas pipeline expansion strategies in areas where heat pumps are efficient, could prioritize electric technologies.
- Introducing carbon taxes or pricing could drive the transition to heat pumps and electric technologies, with part of the revenue supporting renewable energy development.

Source: SHURA Energy Transition Center, "[Electrification of Türkiye's Residential and Industrial Process Heat](#)"