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Issue: 2

SHURA AGENDA

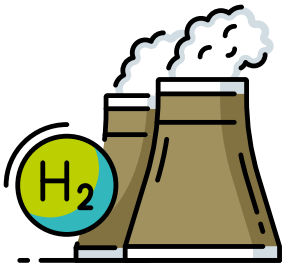
Renewable (Green) Hydrogen

The use of renewable hydrogen in hard-to-abate sectors is a key strategy in the energy transition. Given current costs and sectoral applications, it is essential to prioritize renewable hydrogen deployment in areas where direct electrification is not feasible and where it delivers the greatest benefits.

The second issue of SHURA AGENDA explores the potential role of renewable hydrogen in Türkiye's energy transition.

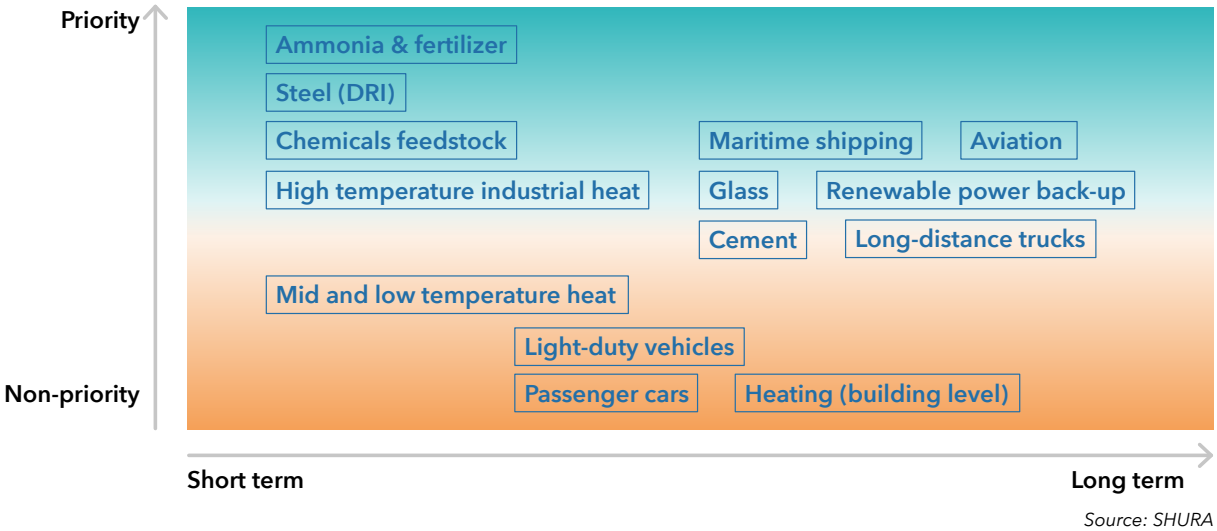
Renewable hydrogen's first stop: The industrial sector

Analyses by SHURA Energy Transition Center highlight that Türkiye's initial adoption of renewable hydrogen will likely focus on producing green ammonia (fertilizer), iron and steel, and chemical and petrochemical products (including refineries). These sectors offer high added value and align with the priorities of the Turkish industry.



In the medium to long term, the glass and ceramics industries, along with long-distance transportation, may emerge as key areas for renewable hydrogen integration.

Recommended priority areas for renewable hydrogen applications in Türkiye



Source: SHURA

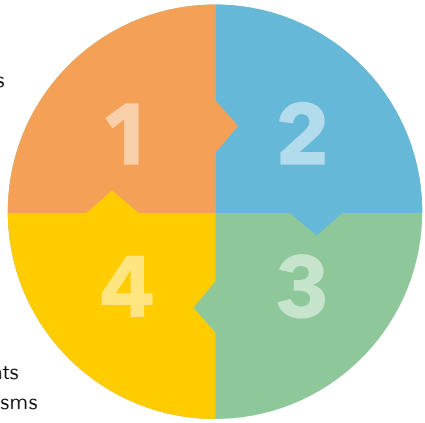
Key strategies for Türkiye

1 Sector prioritization

Focus on sectors with existing hydrogen production and consumption experience, such as refineries and fertilizers, to facilitate a smooth transition to renewable hydrogen.

2 Project partnership and initiatives

Engage in globally recognized projects or best practices while initiating similar efforts in Türkiye to accelerate market development.



4 Cost analysis and support mechanisms

Conduct sectoral cost assessments and implement support mechanisms to promote renewable hydrogen as an alternative fuel while maintaining industrial competitiveness.

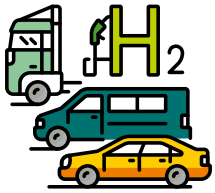
3 Use in scalable areas

Deploy renewable hydrogen in sectors with high scalability potential, such as iron and steel production, to maximize impact and feasibility.

Source: SHURA

Hydrogen as fuel and feedstock: Supporting sectoral transformation

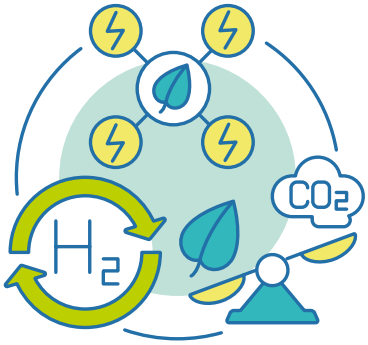
Beyond its role in transportation, hydrogen can replace fossil fuels in industrial applications requiring high process heat and serve as a feedstock across multiple sectors.



- **High-Temperature Industrial Processes:** A fuel for cement, glass, and ceramics manufacturing.
- **Fertilizer Industry:** Used as a feedstock for green ammonia production.
- **Chemical and Petrochemical Industry:** Used as either feedstock or fuel in various sub-sectors.
- **Iron and Steel Industry:**
  - As a **reducing agent** in integrated facilities converting iron ore into iron.
  - As an **oxidizing agent** in natural gas shaft furnaces.
- **Long-Distance Transportation:** Medium-term deployment through hydrogen derivatives.

Renewable hydrogen: A catalyst for Türkiye's economy and emissions reduction

According to SHURA's report, *Renewable Hydrogen in Türkiye's Decarbonization Path: Priority Application Areas and Policy Recommendations*, deploying renewable hydrogen in priority sectors could generate a total economic benefit of USD 130 billion by 2053. Additionally, replacing fossil fuels with renewable hydrogen in end-use sectors are projected to reduce carbon dioxide emissions by 1,025 million tons over the same time period.



Renewable hydrogen can play a pivotal role in decarbonizing energy-intensive industries and reducing Türkiye's reliance on imported energy. So, how can its use be expanded?

SHURA's key recommendations:

- **Sector-Specific Prioritization:** Focus on applications where hydrogen offers the highest benefits and direct electrification is insufficient. Establish sector-specific targets to drive adoption.
- **Aligning with the Energy Transition:** Ensure that renewable hydrogen production complements, rather than competes with, the transition of the electricity sector. New renewable energy plants should be developed for renewable hydrogen generation, following the principle of additionality and integrated into a broader policy framework.
- **Financial Incentives:** Introduce support mechanisms to boost local renewable hydrogen production and attract investment.
- **Regulatory Framework:** Implement legal regulations addressing technical and safety standards for industrial renewable hydrogen use.
- **Public-Private Collaboration:** Foster partnerships and mixed financing models to accelerate commercialization of hydrogen technologies.
- **Coordinated Governance:** Establish a public unit to oversee inter-sectoral hydrogen production and development plans.
- **Infrastructure Development:** Upgrade airports and ports to prevent logistical challenges in hydrogen transportation.
- **Technical Standards:** Define clear technical guidelines for the production and storage of renewable hydrogen in the electricity sector.

Source: SHURA report: "Renewable Hydrogen in Türkiye's Decarbonization Path: Priority Application Areas and Policy Recommendations."

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