



NO HALTEGKEETSROT

Executive Summary: Ramping-Up EU H₂ Economy (13.07.2026)

Context: The EU's green transition is accelerating, with hydrogen (H₂) positioned as a cornerstone for decarbonizing hard-to-abate sectors (steel, aviation, heavy industry). This summary distills strategic priorities, challenges, and regional collaborations from the Luxembourg-Saarland-Greater Region perspective.

1. Strategic Vision & Cross-Border Collaboration

- **Hydrogen Union:** A European H₂ **backbone** is critical for energy independence and resilience against geopolitical shocks. Saarland, Luxembourg, and France are pioneering cross-border infrastructure (e.g., **mosaHYc pipeline, HY4LINK project**).
 - **First-Mover Advantage:** The steel industry (e.g., **SHS Saarland, ArcelorMittal**) acts as a catalyst, with **€4.6B investments** in H₂-ready plants (DRI/EAF transitions) to secure jobs and meet climate goals.
 - **Regulatory Alignment:** Calls for **stable ETS frameworks**, relaxed RFNBO criteria, and harmonized cross-border rules to avoid penalizing early adopters.
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2. Industrial Decarbonization: Steel & Aviation

Steel Sector (Saarland/Luxembourg)

- **Transition Pathways:**
 - **Scrap-EAF (57% market share by 2050):** Zero H₂ use but requires **8.75 GW** electricity.
 - **DRI-H₂ (18% share):** Needs **16.1 Mt/y H₂ + 16.86 GW** electricity (equivalent to **30 nuclear reactors**).

- **Challenges:**
 - **Cost Pressures:** H₂ prices and CO₂ costs threaten competitiveness (e.g., **SHS's tender** revealed high pricing and risk imbalances).
 - **Infrastructure Gaps:** Pipeline delays (e.g., **mosaHYc**) and regulatory uncertainty (ETS, certification) hinder FID.
- **Solutions:**
 - **Public-private risk-sharing** (e.g., **€2.6B public funding** for SHS).
 - **Green lead markets** (public procurement quotas) to stabilize demand.

Aviation (Luxembourg)

- **e-SAF Mandates:** ReFuelEU requires **2% SAF blending by 2025 → 70% by 2050**, but **no European e-SAF plant has reached FID** due to:
 - **Cost Barriers:** e-SAF prices (**€7,520–8,625/tonne**) vs. biofuels (**€1,925/tonne**).
 - **Bankability Risks:** **€15M–45M development expenses** at risk pre-FID; need for **public de-risking** (e.g., **Luxembourg's €59M** in joint auctions with Germany).
- **Opportunities:**
 - **Luxembourg's €500M Sustainable Transport Plan** and **e-SAF Early Movers Coalition, together with Germany and Austria**.
 - **Technological Leverage:** Fischer-Tropsch (FT) pathways using green H₂ + biogenic CO₂ (e.g., **Norsk e-Fuel**).

3. Infrastructure & Regional Synergies

- **Pipeline Projects:**
 - **HY4LINK (Luxembourg):** PCI-status cross-border links to **France (2032)**, **Belgium (2035)**, and **Germany; 12 municipalities** involved.
 - **mosaHYc:** Connects **Carling (FR) → Saarland**, anchoring SHS's H₂ supply.
- **Natural H₂ Breakthrough (Lorraine):**
 - **Française de l'Énergie (FDE)** discovered **34 Mt H₂ reserves** (target: **20 Mt/y by 2030**) at 2.4 km depth.

- **Direct grid integration** planned via **mosaHYc**, reducing import dependencies.

4. Economic & Social Barriers

- **Financing Gaps:**
 - **High DEVEX/CAPEX:** e-SAF and H₂ projects require **€1B+ investments** with **7-year lifecycles**; banks classify as high-risk + high OPEX.
 - **Demand:** Public funding (e.g., **EIB's 50% climate portfolio**) must bridge private sector reticence.
- **Public Acceptance:**
 - **Awareness Growing:** 58% of NRW public now knowledgeable about H₂ (vs. 52% in 2022), but **trust in government dropped to 42.5%**.
 - **Risk Perception:** **Truck transport** viewed as riskier than pipelines; **local NIMBYism** threatens projects.
 - **Solutions:** **Flagship visibility projects** (e.g., H₂ buses) and **scientist-led communication**.

5. Key Demands & Policy Recommendations

Stakeholder	Priority Asks
Industry (SHS, Paul Wurth)	Relax RFNBO rules; flexible H ₂ contracts; ETS stability; green premiums.
Governments	Accelerate permitting (e.g., HY4LINK's 2026 NDP); de-risk FID via guarantees.
Financial Sector	Long-term bankability tools (e.g., Carbon Contracts for Difference).
Public	Transparent benefits communication; local job/environment trade-off clarity.

6. Urgent Next Steps (2026–2030)

- **Infrastructure:** Finalize **mosaHYc/HY4LINK** permits; launch **France-Luxembourg link (2032)**.

- **Financing:** Secure **€2B+** for e-SAF/DRI plants; expand **H2Global auctions**.
 - **Regulation:** Harmonize **RFNBO/ETS rules** across EU; fast-track **H2 transport networks**.
 - **Innovation:** Scale **natural H₂ extraction (Lorraine)** if proved and possible and **e-SAF FT pathways**.
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Conclusion

The EU's H₂ economy is at a **tipping point**: industrial leaders (steel, aviation) are committing to transitions, but **infrastructure delays, cost pressures, and social acceptance** could derail progress. **Cross-border collaboration** (Greater Region), **targeted public funding**, and **regulatory clarity** are non-negotiable to meet 2030–2050 climate goals while preserving competitiveness.

Open Question: *How can Luxembourg and Saarland leverage their first-mover status to attract private capital and ensure just transitions for workers?*
