Bridging the gap: policy needs to realize a green hydrogen valley in Iceland

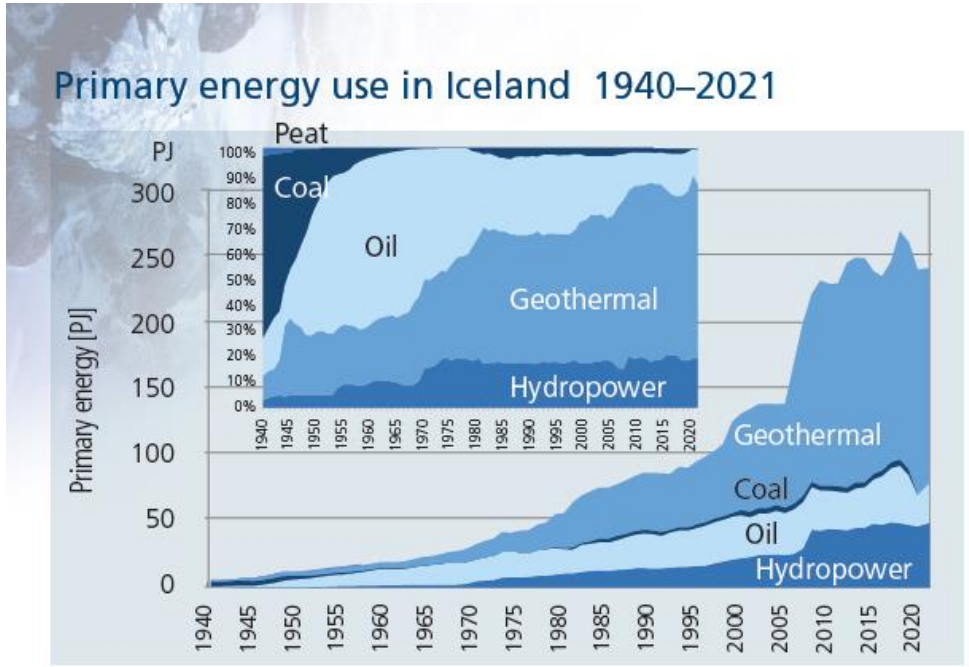
Brynhildur Davíðsdóttir, Professor

University of Iceland

ENVIRONMENT AND NATURAL RESOURCES

Energy and Iceland

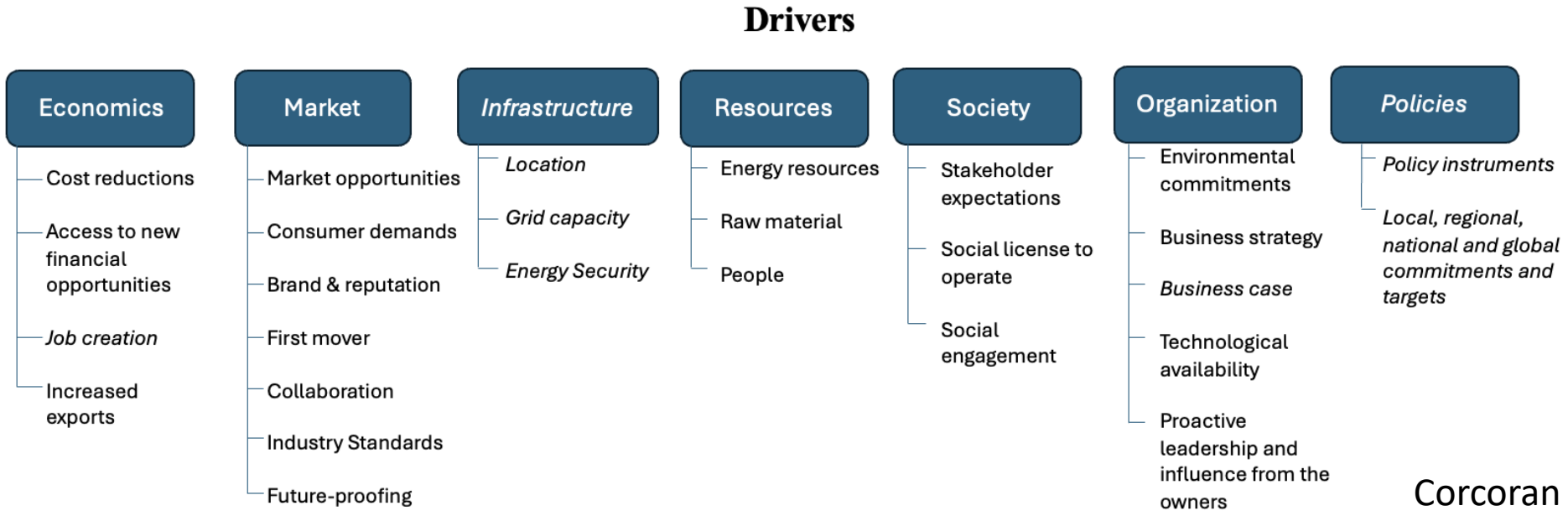
- About 86% of primary energy is renewable
  - Transport, fishing industry
- Ambitious climate and energy targets in 2040:
  - Carbon neutrality
  - Independence from fossil fuels
  - Hydrogen and hydrogen derivatives roadmap
- Significant challenges to realize ambition:
  - Lack of coordination between climate and energy plans
  - Weak electricity grid
  - Lack of energy for the transition



Source: Orkustofnun

H2AMN case studies in Iceland

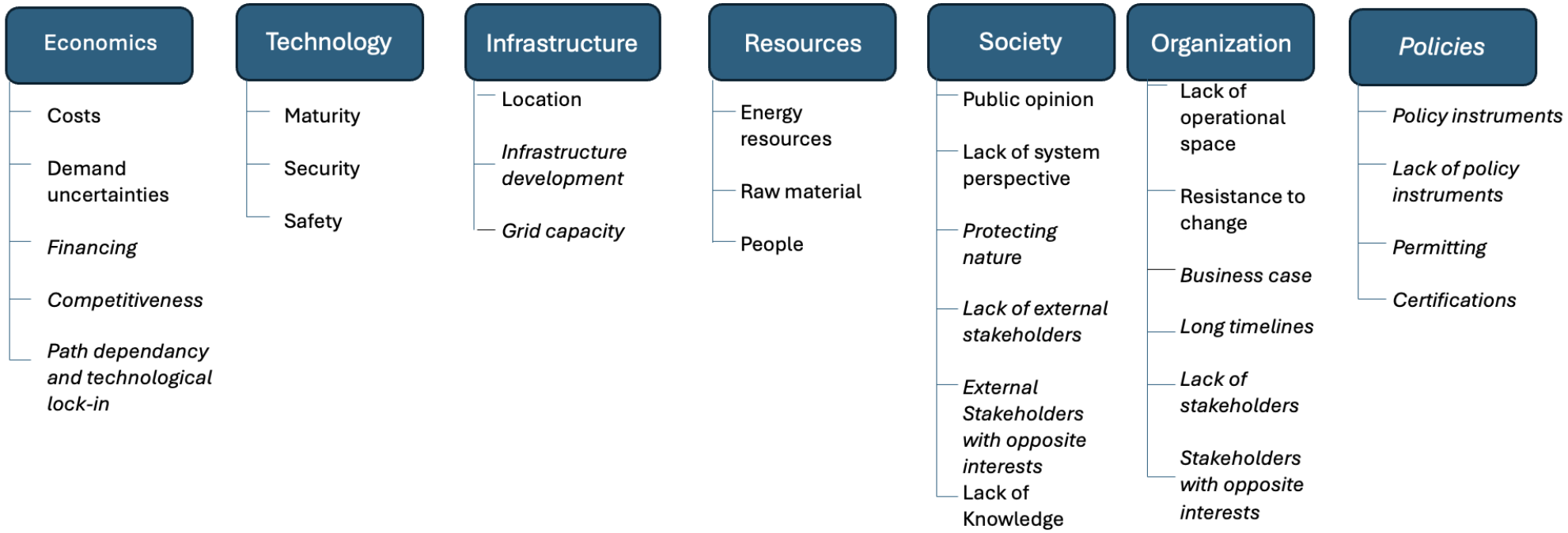
- Three case studies to compare and contrast the feasibility of hydrogen valleys in Iceland
- Semi-structured interviews with stakeholders to understand drivers and barriers to the realization of a hydrogen/hydrogen derivatives valley
- Identifying what are the policies needed to create the enabling environment



Corcoran et al 2025

- Ambitious climate and energy targets
- Policy instruments that are effective and strictly enforced
- Lower electricity prices
- Creates flexibility in the power system
- Market opportunities, consumer demands, future proofing
- Technologies ready for scale-up

Barriers



Corcoran et al 2025

Barriers (examples)

- **Lack of resources**
  - Lack of electricity for the production of hydrogen/hydrogen derivatives
  - No prioritization
- **Economics**
  - Low price of fossil fuels (and other colors of hydrogen) not competitive
  - Hard to secure off-takers, is risky for them as well
  - Lack of demand
  - Financing a major barrier, is a risky investment. Hard to achieve project finance
  - High costs – need to scale up
  - First mover disadvantage both on the supply and the demand side
- **Technology and infrastructure**
  - Competing with mature already upscaled technologies
  - Immaturity of technologies at scale
  - Lack of infrastructure
  - Grid capacity
- **Society**
  - Public opinion
  - Backlash against new power plants

Policy Barriers

- **Lack of overall vision and strategic thinking at an energy systems level**
  - No coordination between climate and energy plans
  - Silo-thinking
  - No plan for the energy resources needed
  - Lack of prioritization
- "The government has been very open to the idea of alternative fuel, but they've not been very keen on doing anything about it"

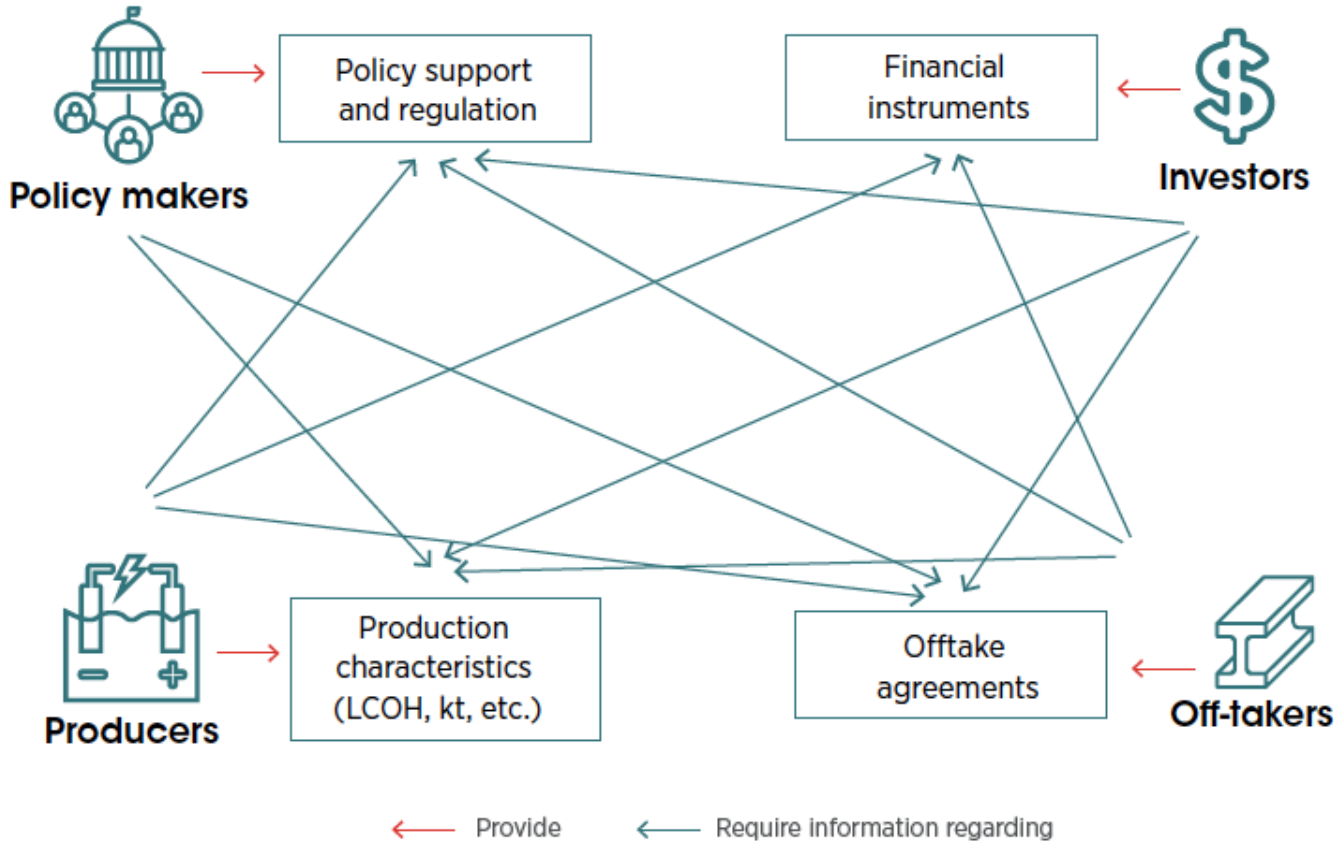
- **Lack of regulations and standards**
  - Regulatory framework not ready
  - Fragmented and inconstant standards
  - Slow development of standards e.g.
    - Safety and reliability
    - Performance
    - Design

- **Lack of regulations and standards**
  - Lack of certification

- **Lack of effective policy instruments in particular financial support**
  - Lack of coverage in climate action plan
  - Low carbon prices
  - Insufficient economic incentives to stimulate production, infrastructure, end-use

The interconnection between all these barriers creates ”The Green Hydrogen Deadlock"

Figure 20 The green hydrogen deadlock



IRENA 2024

How to bridge the gap: policy needs to break the deadlock (examples)

- **Holistic strategic thinking**
  - Coordination of climate and energy goals including the hydrogen strategy
  - Coordinated and inclusive action plans
  - Coordination of timelines
  - Prioritization of energy resources
  - Transparent implementation of EU rules

- **Regulatory instruments**
  - Standards and certification
  - Bans and mandates e.g. blending standards

- **Economic incentives**
  - High cost of carbon
  - Risk mitigation and risk sharing as technologies mature
  - Subsidies for Capex
    - Production
    - Infrastructure
    - Use
    - Pilot projects
  - Innovative support to financing
- **Demonstration projects**
- **Stakeholder engagement**
  - Public acceptance

Concluding comment

- The role of governments is to set ambitious(but realistic) targets and to create the enabling conditions needed to reach set targets:
  - Demand
  - Supply
- If a hydrogen valley is the aim, significant opportunities to do better