

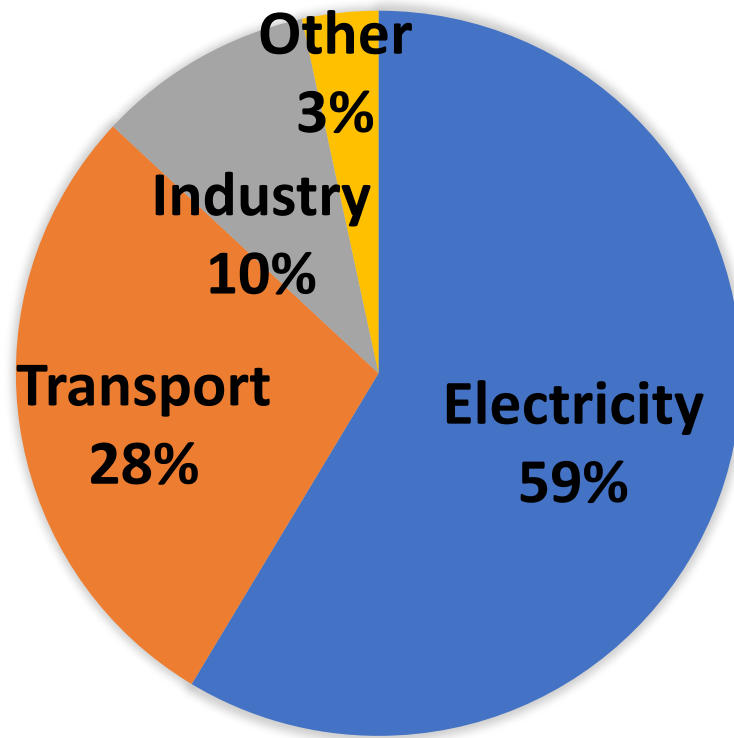
Hydrogen in Israel

Shahar Dolev
Long Term Planning

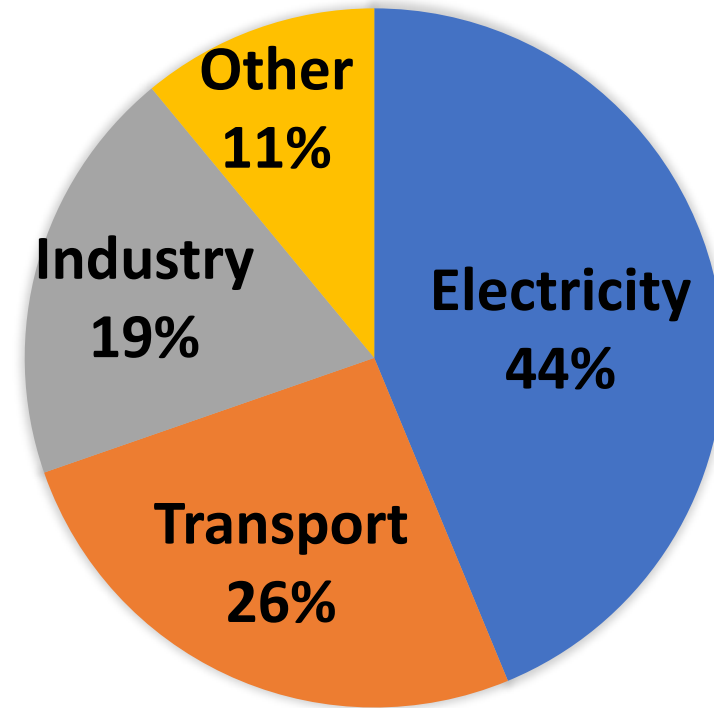
Gideon Friedmann
Acting Chief Scientist

Israel CO₂ Emissions

CO₂ Emissions Israel (2018 65 Mt)



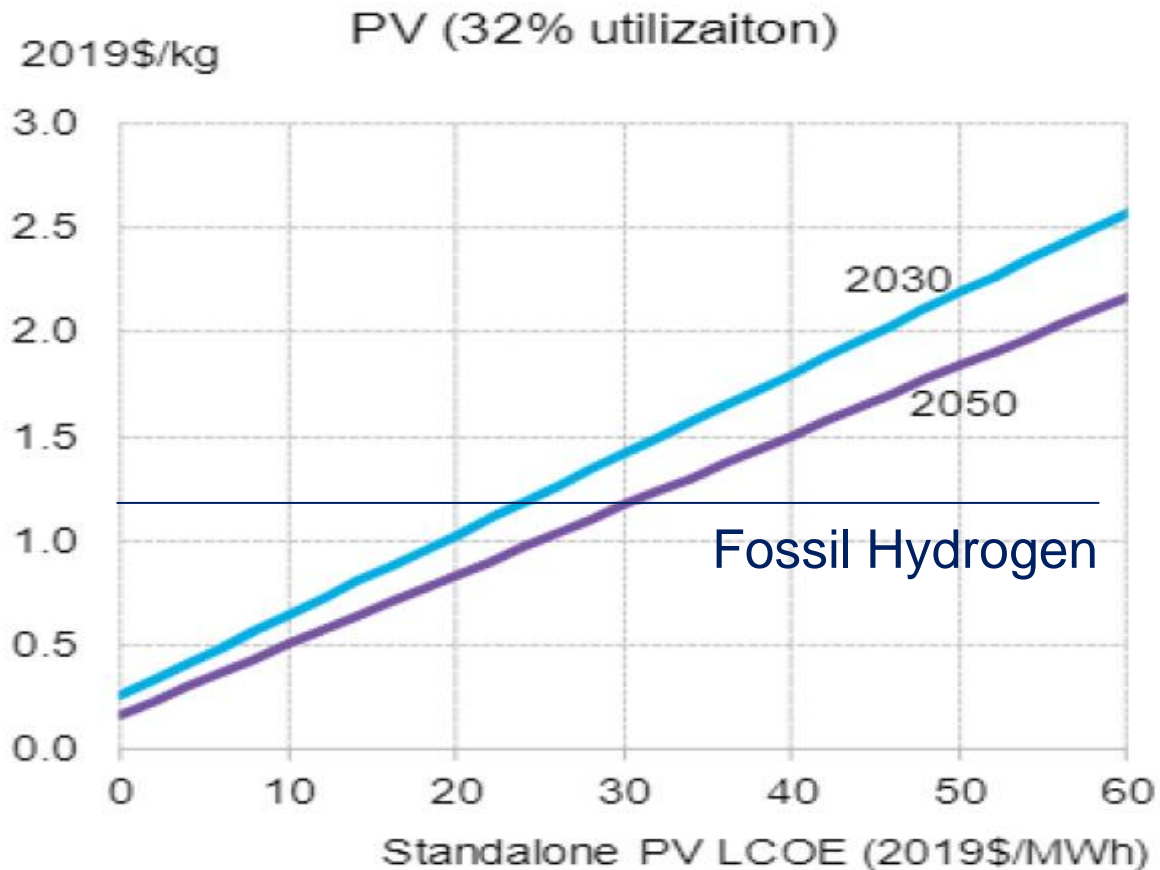
CO₂ Emissions World (2018 32 Gt)



Hydrogen Challenges

- Technology
- Costs
- Logistics
- Efficiency

Cost of Solar Hydrogen (Bloomberg)

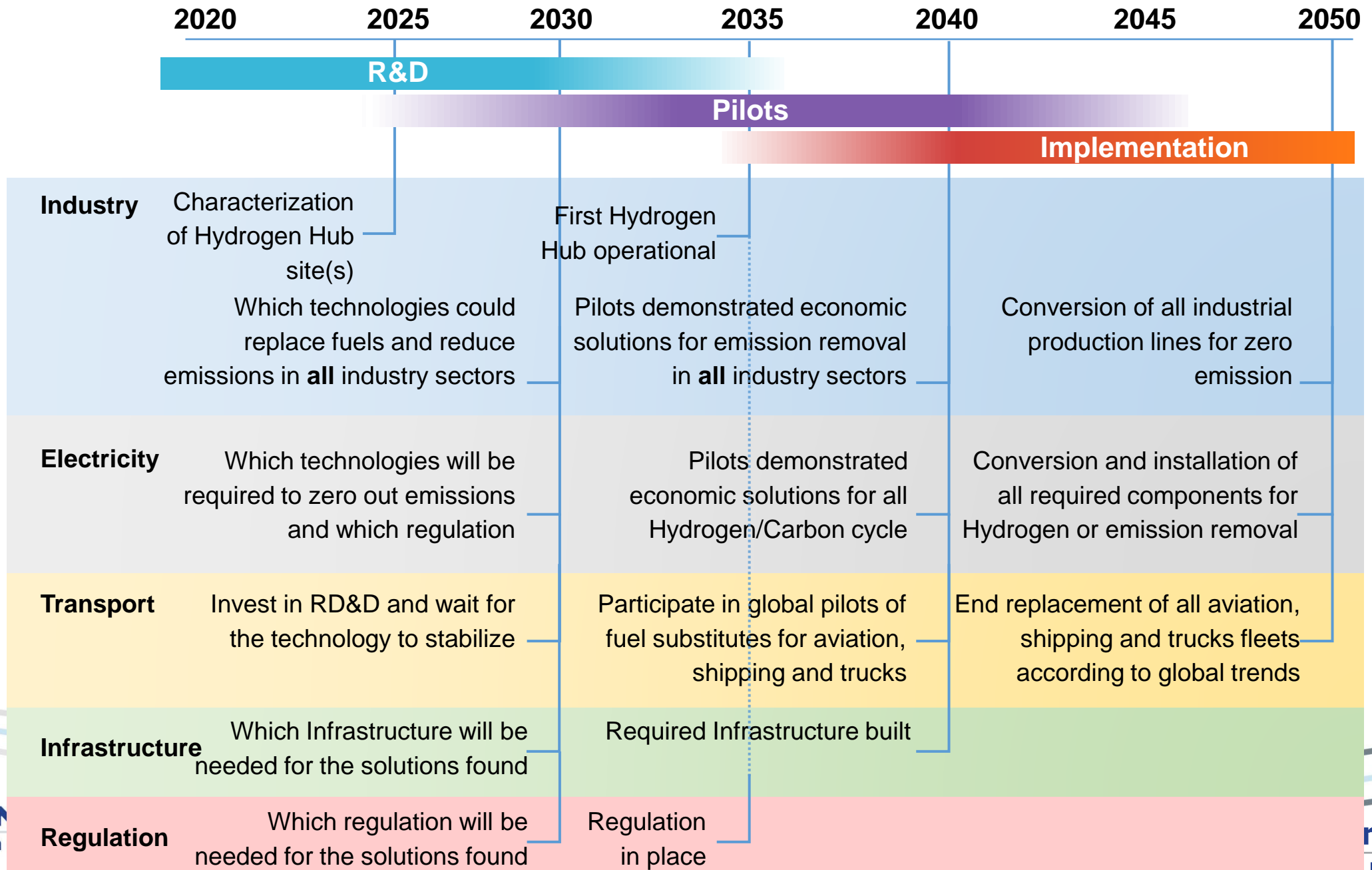


Israel Special Considerations

- Israel is a small economy
- Israel is a small country
- Israel has a small industrial sector
- Israel has large NG reserves
- Israel has (almost) exclusively solar renewable energy
- Israel has a strong innovation eco-system
- Israel has close neighbors w huge potential for green Hydrogen
- Israel has special needs for resilience of local grids



Draft Long Term Strategy For Hydrogen



Short Term Policy

- Invest in R&D
 - Currently strong academic research in FC & Hydrogen
- Implement current State of Art in small scale
 - Emphasis on heavy transport
 - Special use cases
 - Industry
- Invest in blue Hydrogen
 - From large NG resources
 - Prepare NG network for Hydrogen
- International Collaboration

Recent Steps

- Gencell IPO
- H2PRO – Investment by Breakthrough for Energy
- First Refueling station project started
 - Hydrogen supply supported
- Discussions on support for first heavy transportation (w Hyundai)
- Hydrogen Pyrolysis research initiated
- Hydrogen storage underground research
- FC experiment in space
- Publication of 2050 plan with 80% emissions reductions – and no direct commitment in Hydrogen

Additional Key Players

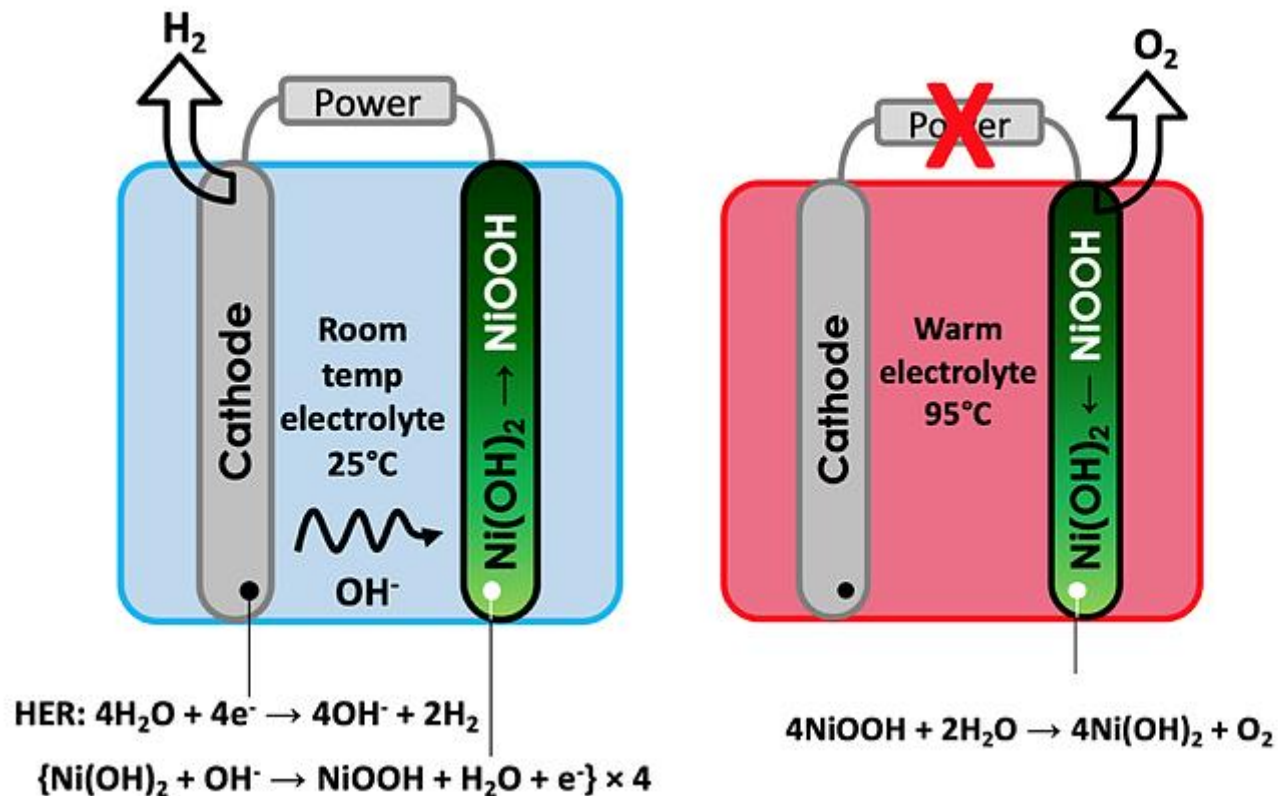
- Bazan – Oil Refineries
- ICL
- Sonol
- Colmobil

H2Pro – Power to Hydrogen

Project: Novel Electrolysis

Fund: 2 Academic Projects
about 1.2 Million Shekel

Year: 2015, 2017



H2 Production from NG

Project: H2 Pyrolysis - Brian Rosen, TAU

Fund: Academic Project
about 0.5 Million Shekel

Year: 2020



NrgStoredge, Electriq Global – Hydrogen Storage

Project: Hydrogen storage in
carrier (Potassium Formate,
Boron Hydride)

Fund: 3 Projects
about 3.6 Million Shekel

Year: 2017, 2018, 2019

Gencell

Project: Efficient ammonia cracker
for Fuel Cells

Fund: About 1.6 Million Shekel
through BIRD Energy

Year: 2016



Hydrolite (AMFC – Formerly PO Celltech)

Project: a. Smart EV demonstrator - range extender
b. 5 KW fuel cell w novel membrane

Fund: a. About 2.1 Million Shekel
b. About 0.8 Million USD (with W7energy)

Year: 2019, 2020

Elbit Systems (with Ballard)

Project: Development of a hydrogen powered vertical take-off and landing drone

Fund: About 1.6 Million Shekel through BIRD Energy

Year: 2019



Sonol + Metropolin – Hydrogen Fueling Station

Project: First Hydrogen refueling station + FC Bus

Fund: About 4.2 Million Shekel
Pilot

Year: 2019





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