

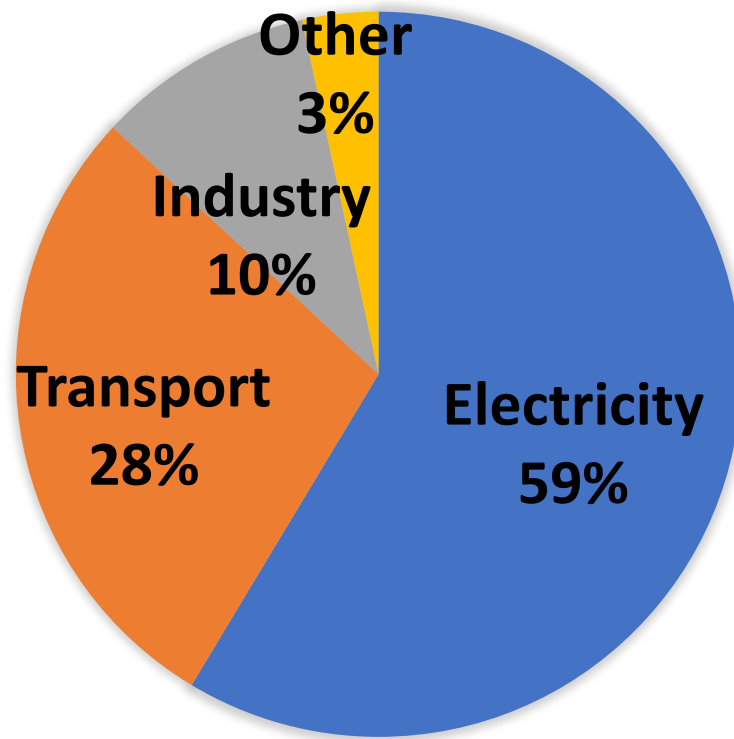
# Hydrogen in Israel

Gideon Friedmann  
Acting Chief Scientist

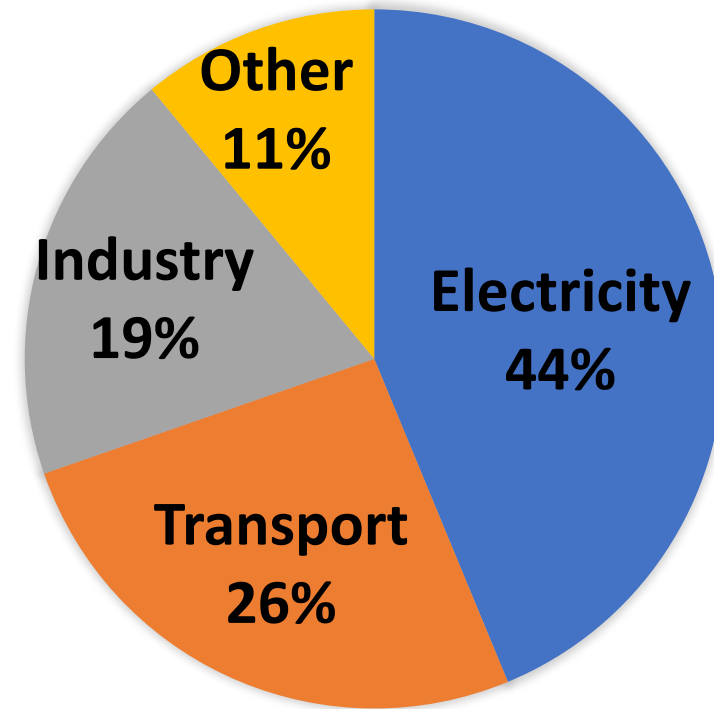


# Israel Co<sub>2</sub> Emissions

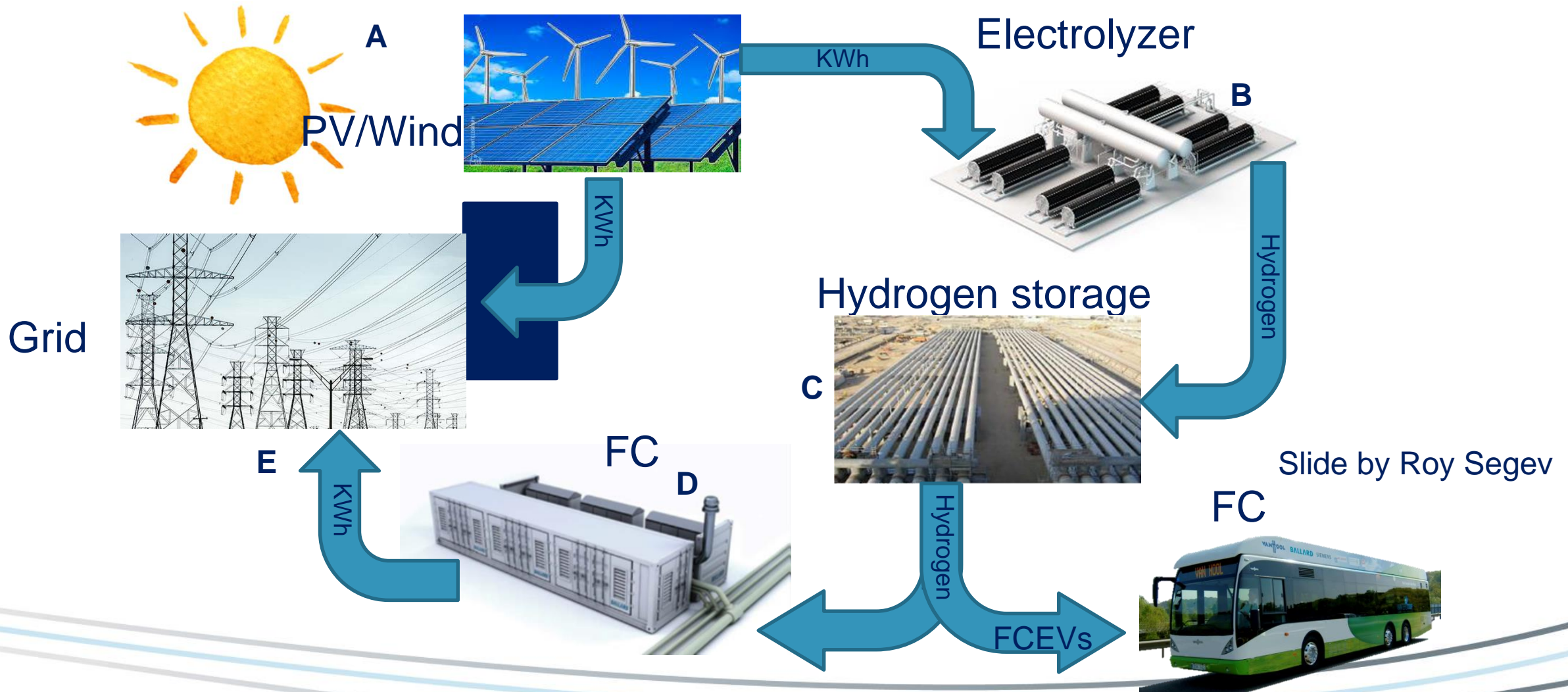
CO<sub>2</sub> Emissions Israel (2018 65 Mt)



CO<sub>2</sub> Emissions World (2018 32 Gt)



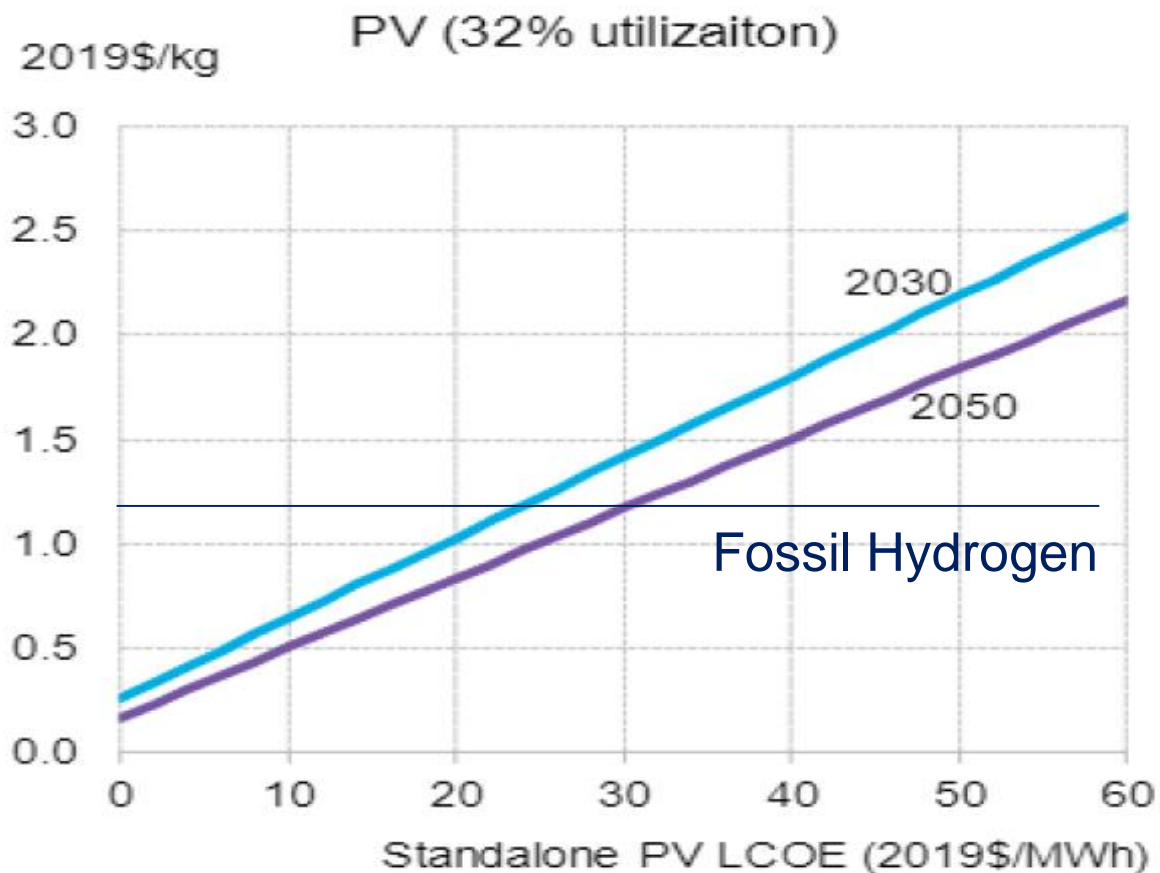
# The Hydrogen Cycle



# Hydrogen Challenges

- 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

# Israel Hydrogen 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

# Main Events

- 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





# Interesting Locations – Need a story

- Haifa
- Ashdod
- Dead Sea / Dimona

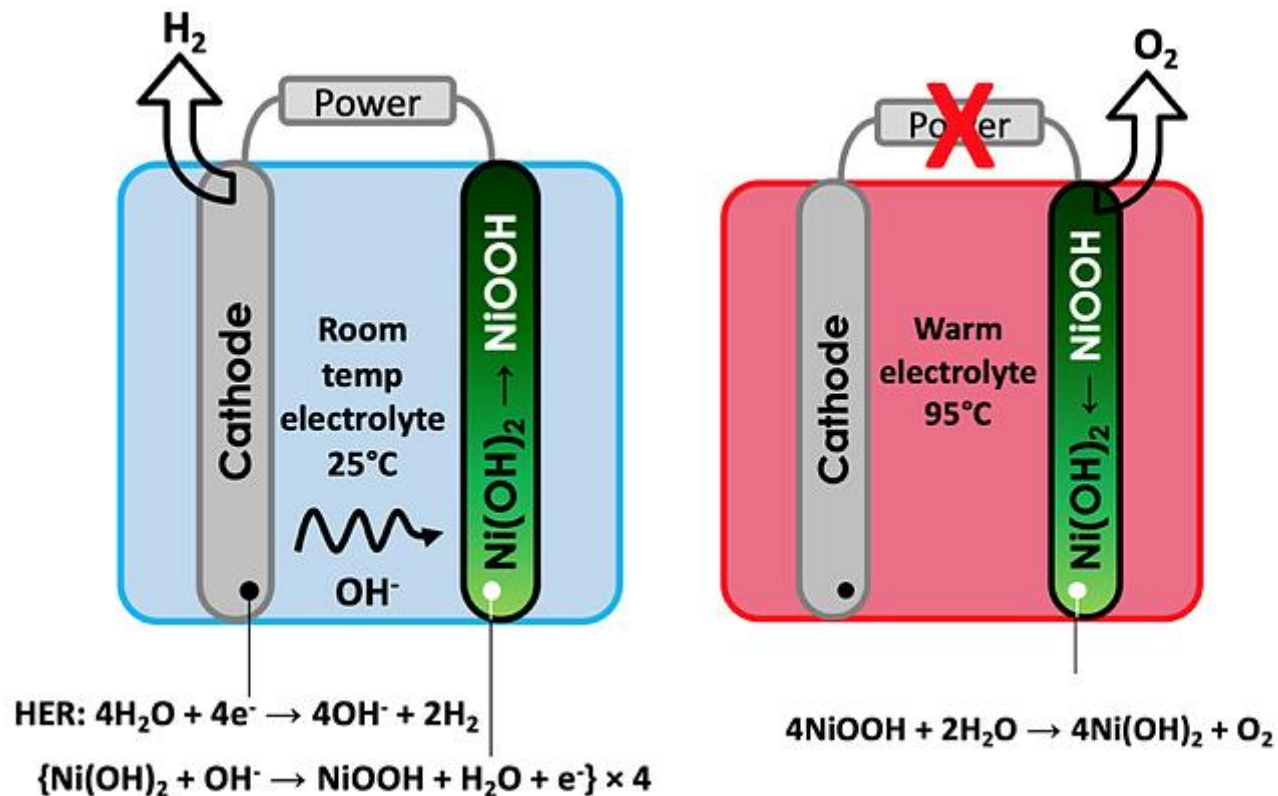


# H2Pro – Power to Hydrogen

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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