Local Energy Management – Advantages 4 Israel

Gideon Friedmann
Acting Chief Scientist

Advantages of Renewable Energy

- Energy Security and Diversity
- Emissions Reduction
- Electricity at Operating Cost at the end of the period
- Price stability
- Educational / PR Value Sustainability

2014

Sensitive Points in Today's System

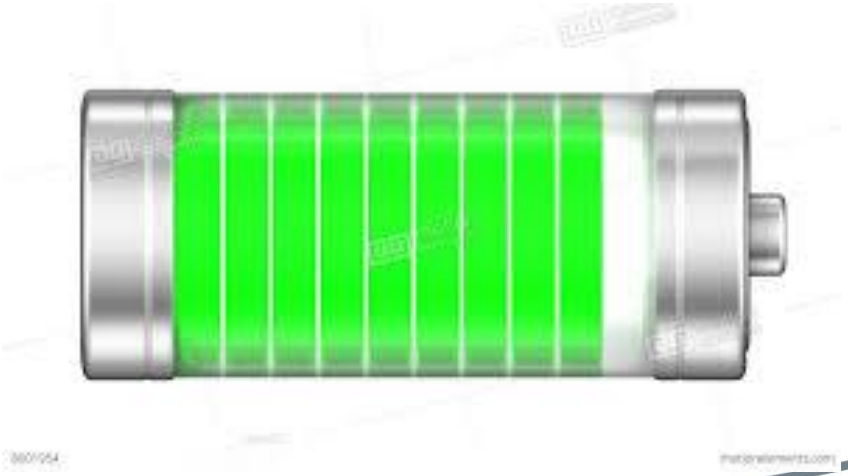
- Gas fields
- Gas Rigs
- Central Gas transmission
- Main Power Plants
- Main Switching Points

But Solar / Wind are intermittent

- Need Storage
- Need Backup
  - Backup creates **Redundancy**

Must Have Storage

- Storage is a must for significant penetration of renewables
- Li-Ion industrialization projections look very positive
- Several other technologies are under development
- Competition between batteries and hydrogen
- Long term storage must use fuels

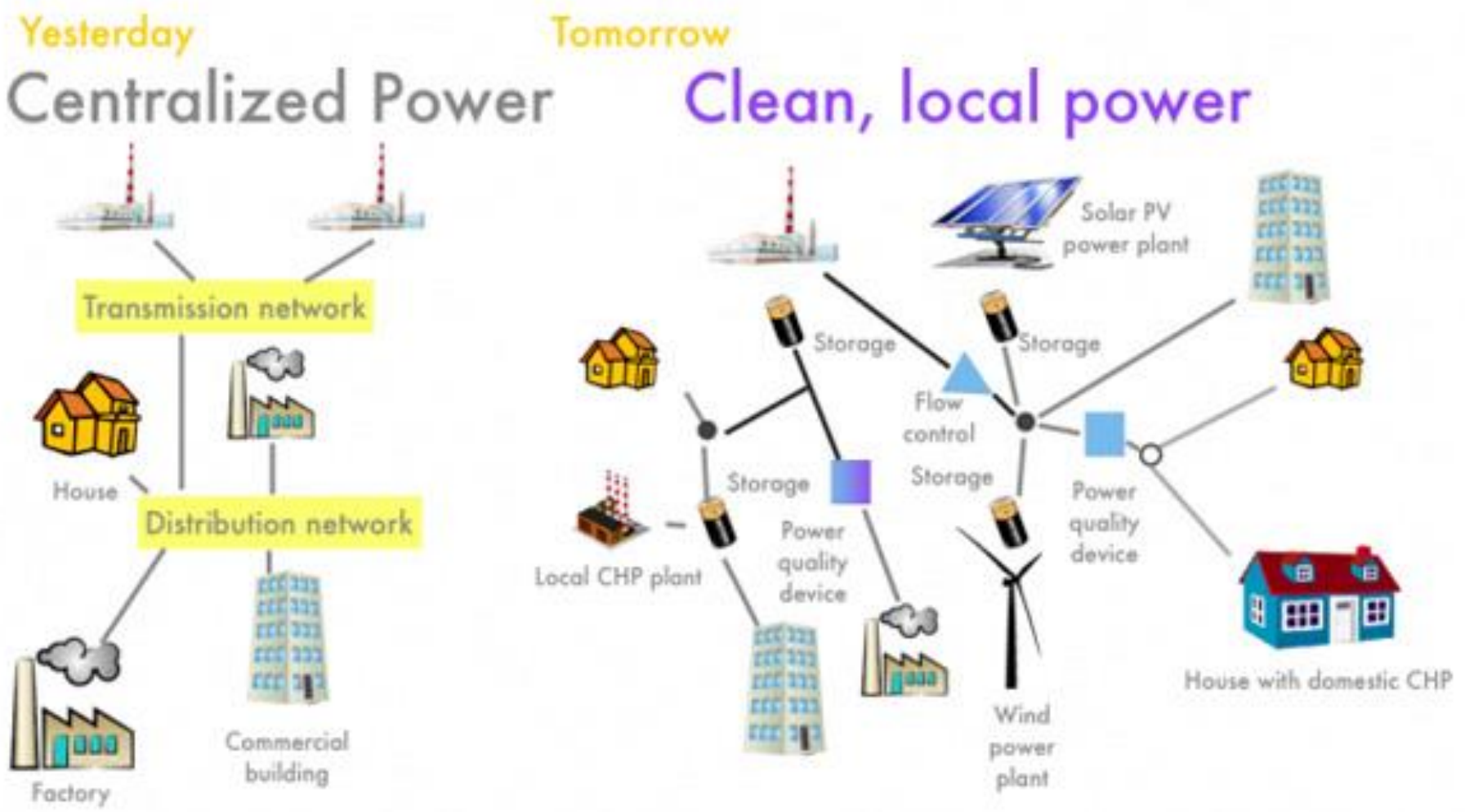


Local Power Generation

Is Local Generation Enough?

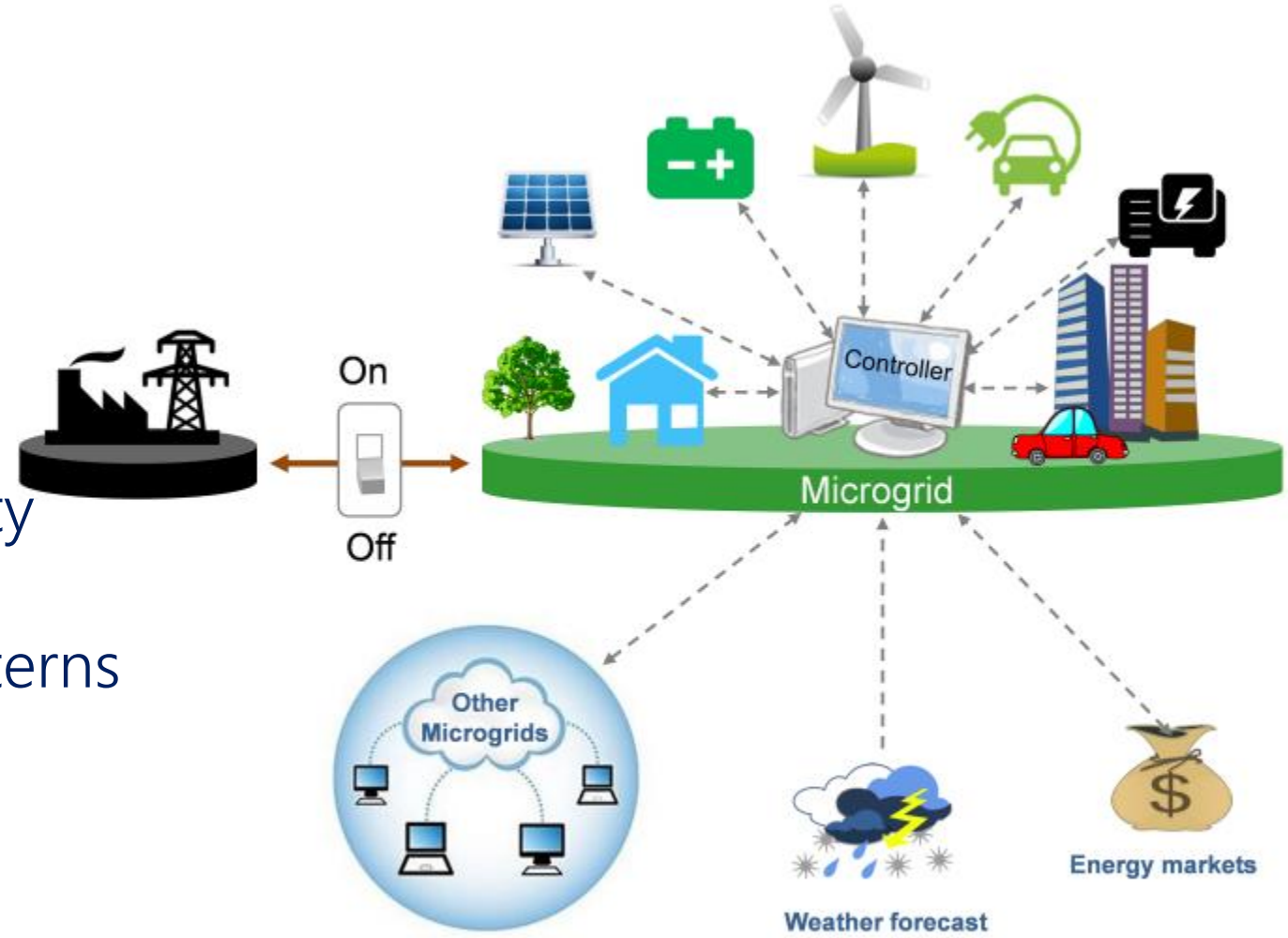
- Normally - yes
- But winter is a challenge
- Need Storage in large quantities
  - Phinergy type
  - Hydrogen / Synthetic fuels
  - Cars

Distributed Generation



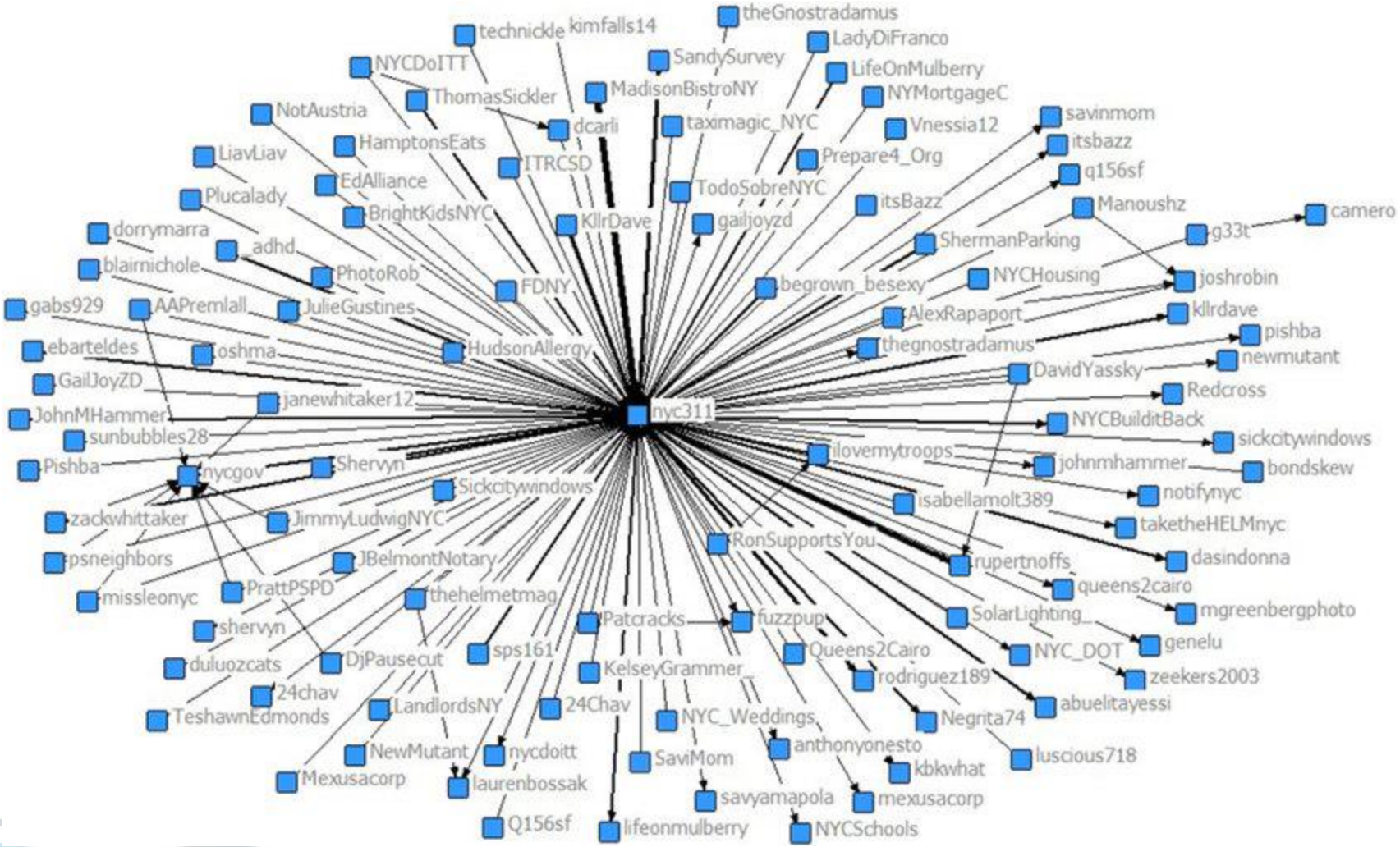
Microgrid

- Everyday Optimization
  - Various generators (solar, CHP)
  - Various consumers
  - Storage
  - Control Center - Flexibility
  - Demand Response
    - Use & Generation Patterns
- Interface to the outside grid
- Emergency resilience



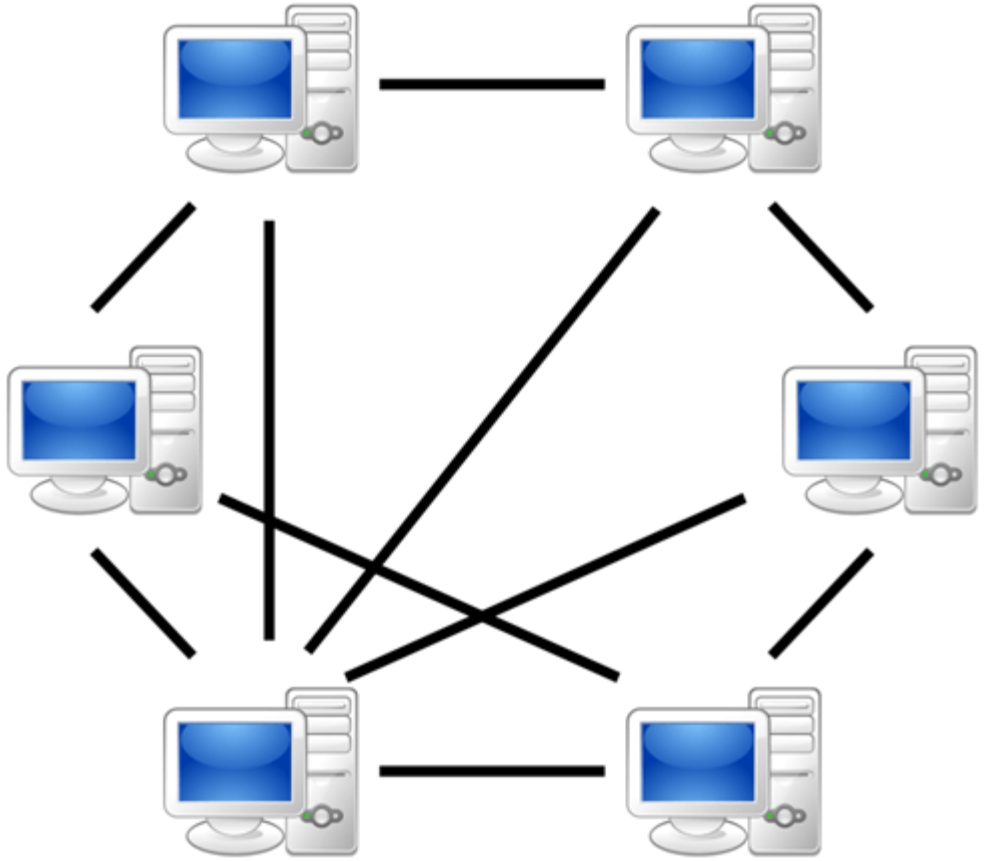
Copyright Berkeley Lab

Distributed Generation – Scenario 1



Distributed Generation – Scenario 2

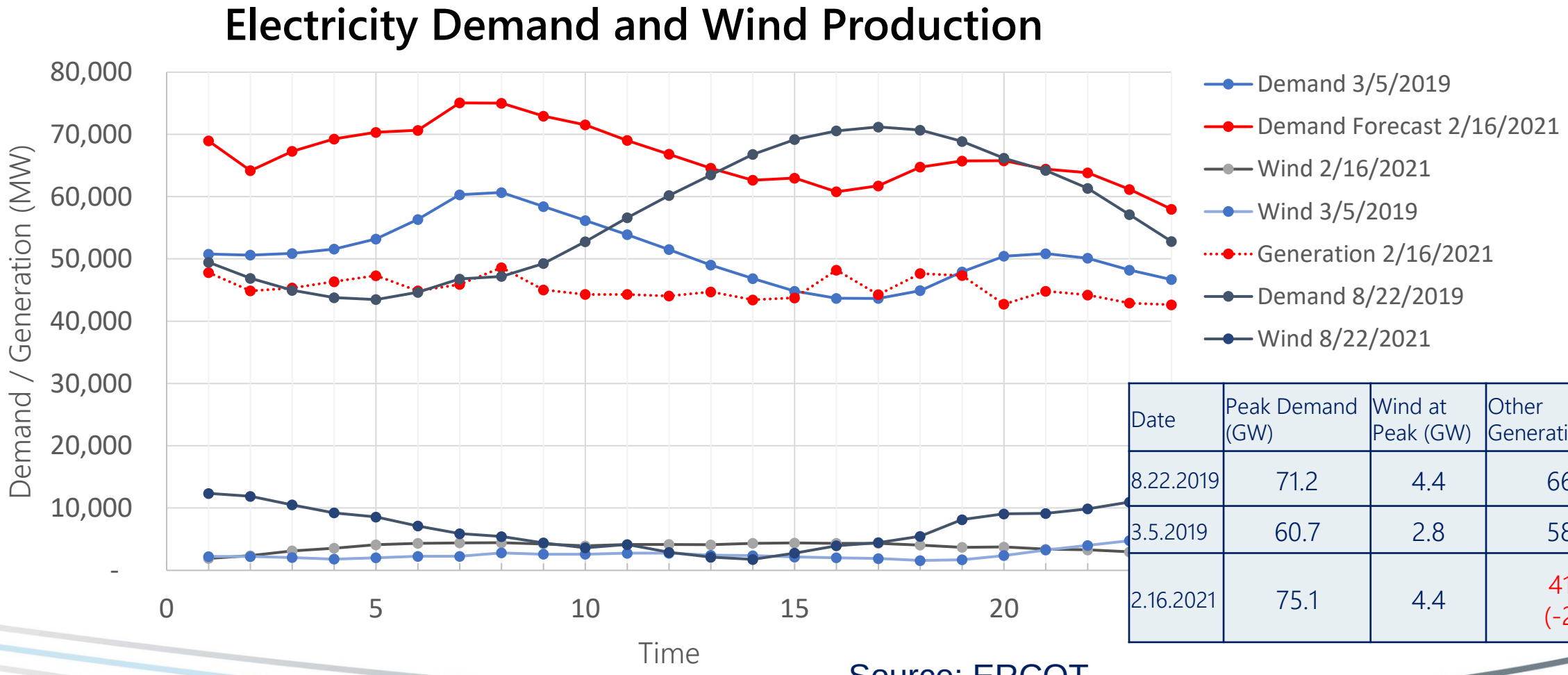
- Nodes communicate to each other
- Multiple routes
- Resource optimization
- Resilience



Support Examples

- Microgid in Kibbutz Maale-Gilboa (2016)
- EV charging effects on local grid
- Solar Rooftop mapping Eilat (2017)
- Microgrid Planning Eilat – (2018)
- PV Potential of building walls
- Smart city Ashdod (MIT living lab)
- Local Energy Management AI engine (2021)
- Microgrids w storage – 6 projects 31 M Shekel w 9 M support (!) 2021

Resilience in Texas – Feb. 2021



Date	Peak Demand (GW)	Wind at Peak (GW)	Other Generation (Gw)
8.22.2019	71.2	4.4	66.8
3.5.2019	60.7	2.8	58.9
2.16.2021	75.1	4.4	41.5 (-29)

Source: ERCOT

gideonf@energy.gov.il
+972-58-5337565