The Smart Grid

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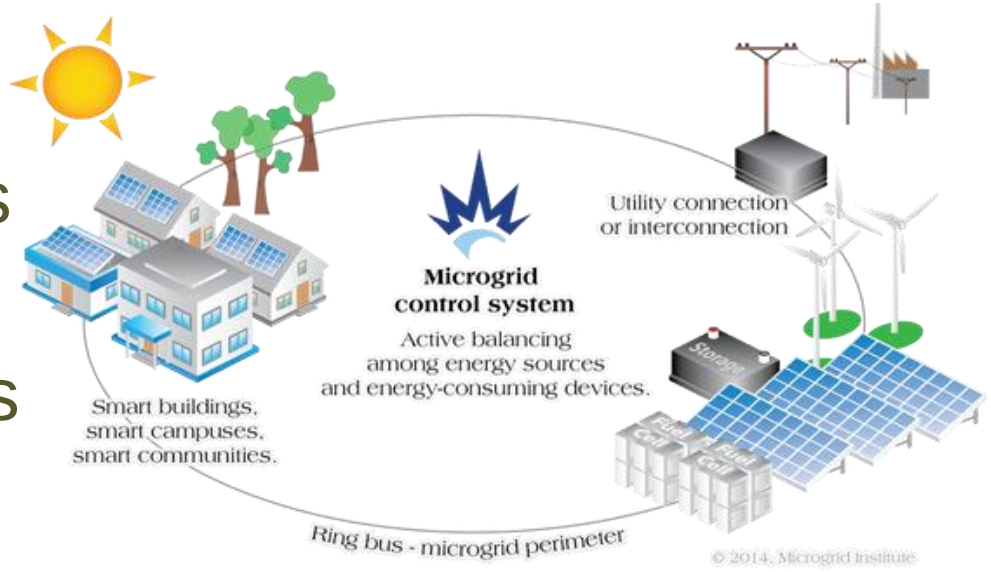
The Smart Grid

- A Smart grid is an electrical grid that uses information and two way communication technology in an automated fashion
- End points are prosumers
- Goals:
  - **Efficiency** – Asset Utilization, Operation
  - **Reliability** – Quality, Resilience, Security
  - **Economics** – Service, Sustainability

- **RE**
- **EV**

Microgrid

- Local small scale grid
- Management
  - Various generators (solar, CHP)
  - Various consumers
  - Storage
  - Control Center
- Interface to the outside grid



RFI Smart Grid (2/2015)

- Key technical issues, topology & optimal settings in building a micro-grid.
- Relationship to other infrastructure in the grid (heat, water, sewage, gas, information)
- Management of the micro-grid (electricity production and consumption control, automation, sharing of resources, information system and management)
- Relationship to the external grid (including resilience to blackouts).

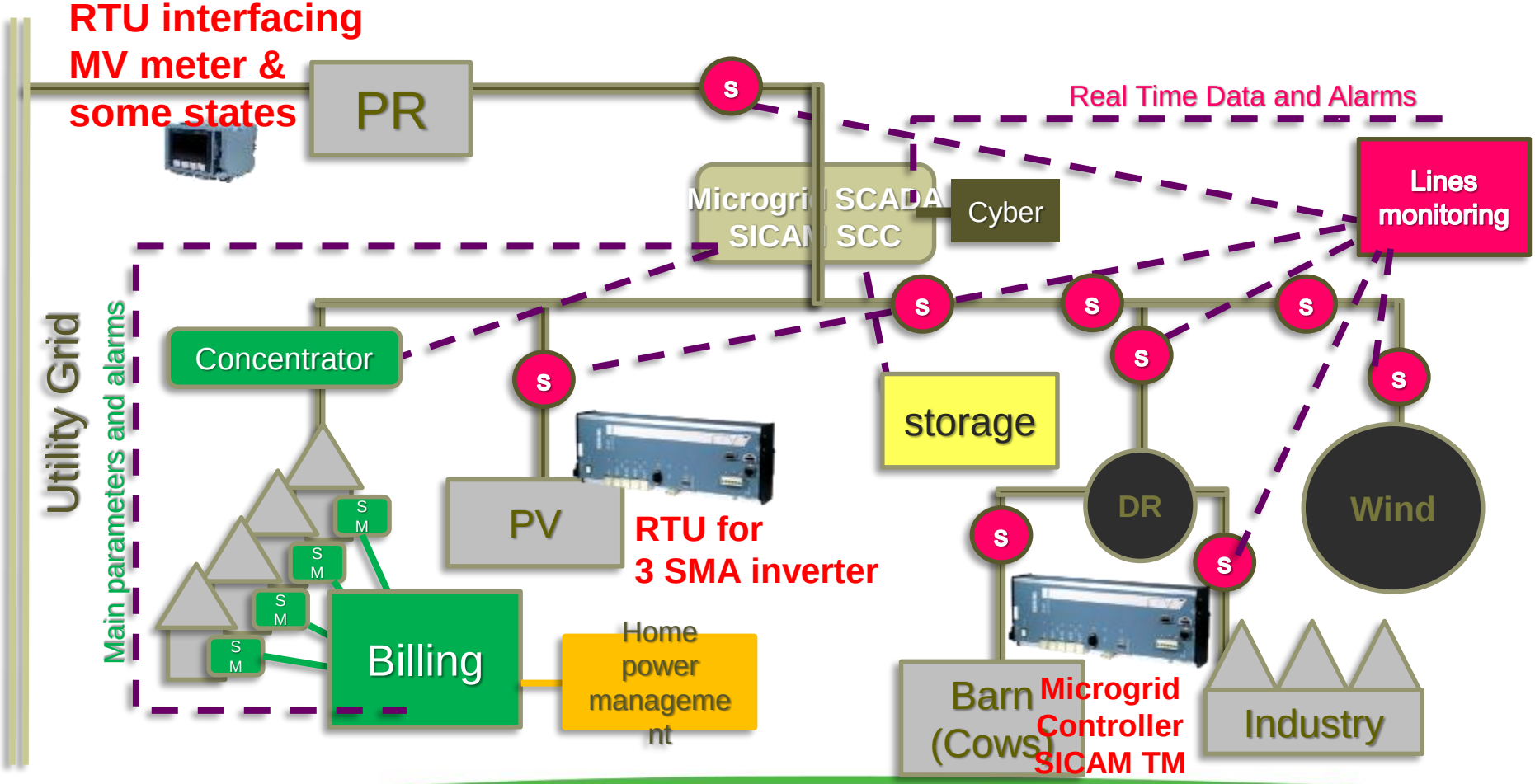
Innovation support in SG

- Over the last 2 years supported 7 projects (net) for about $2 million
- Many additional projects that tie in (eg renewable energy).

Support Examples

- Microgid in Kibbutz Maale-Gilboa
- Evaluation of Grid for high RE penetration
- EV charging effects on local grid
- Solar Rooftop mapping Eilat
- PV Potential of building walls
- Smart management of water grid
- Smart city Ashdod (MIT living lab)

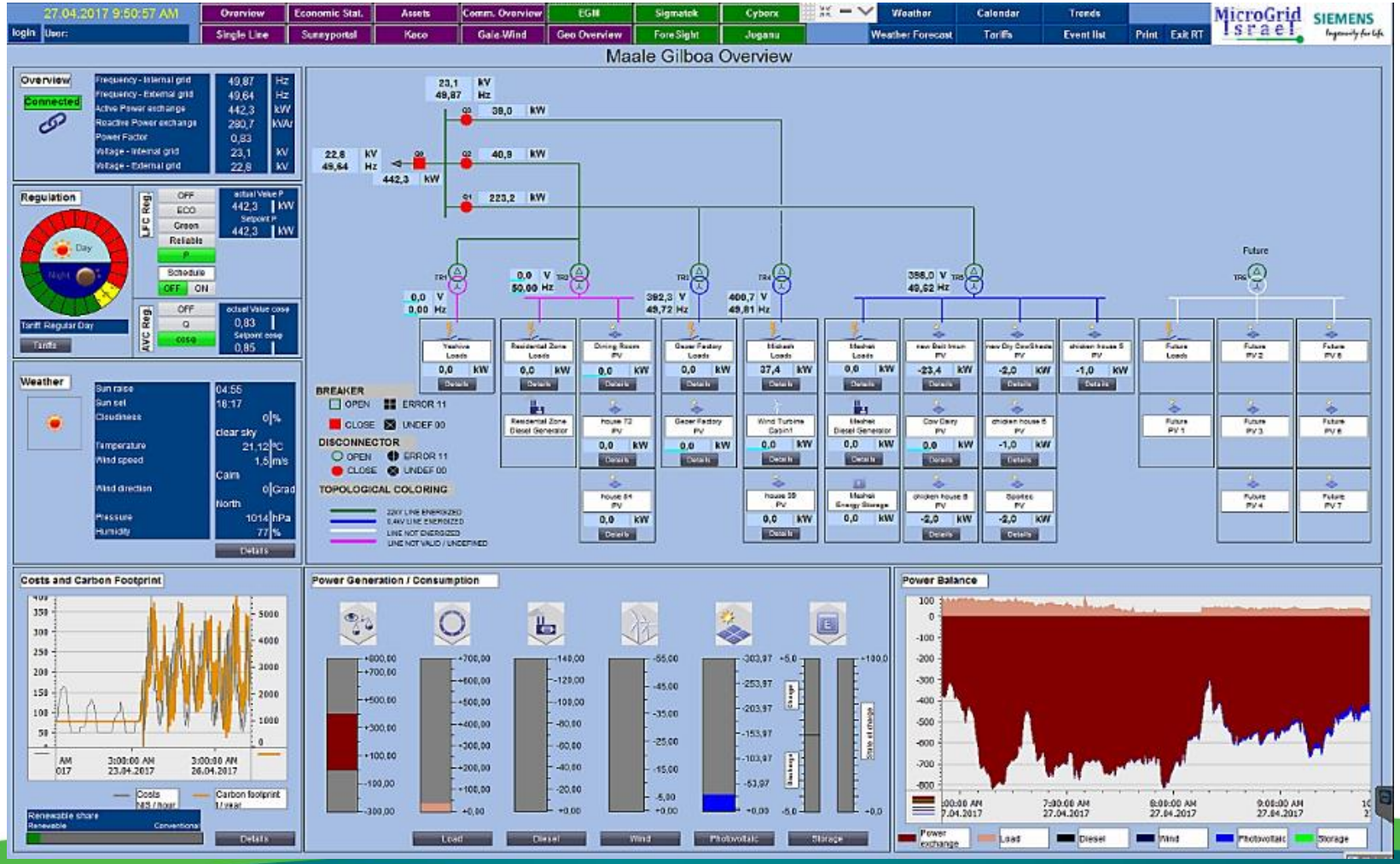
Grid Architecture



Microgrid Modes

- Operation of the grid according to:
  - Minimum cost requirements
  - Maximum reliability
  - Minimum emissions
  - Peak shaving
- Islanded or grid connected modes
- Priority feature

Main Control Screen



Migrogrid - Benefits

- Optimize the dispatch & reduce the energy total cost
- Power supply for critical load
- Island mode.
- Efficient integration of renewable energy
- Energy efficiency
- Improved Maintainability
- Power quality

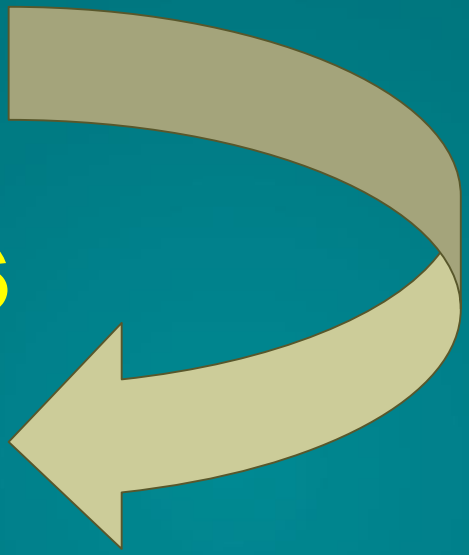
Quantifiable Actions

- Industrial Demand management
- Domestic load optimization
- Resiliency
- Preventive maintenance
- Tariff balance
- Emission impact cost
- Peak shaving saving
- Grid malfunction improvement
- Cyber protection cost saving

Smart Grid

- The Smart Grid is a **required** infrastructure
- Will enable penetration of new services and technologies
- The regulator must push for implementation

Thanks



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