



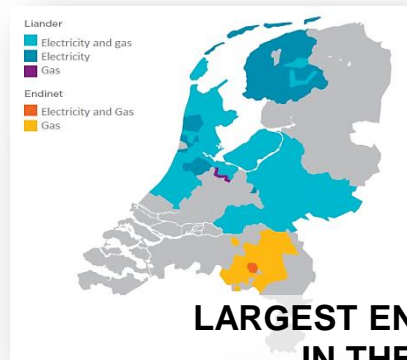
Use cases in our real-world midvoltage grid lab



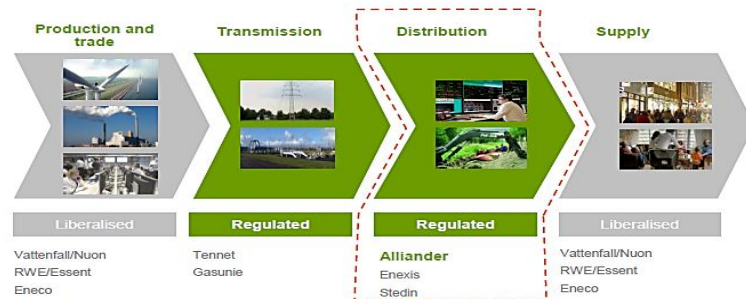
Presented by **Robin Hagemans MSc, Alliander**
Gies Bouwman MSc, Alliander

Alliander – Key Figures

| Customers | |
|------------------------|---------------|
| Million | Marketshare % |
| 3,4 | 37% |
| Revenue | Employees |
| € Billion | FTE |
| 1,6 | 6.800 |
| Annual outage | |
| Electricity in minutes | 20,4 |
| Gas (Liander) in sec | 35 |
| Gas (Endinet) in sec | 67 |

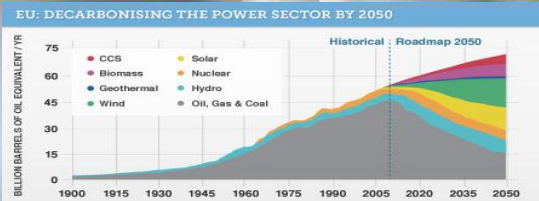


**LARGEST ENERGY GRID COMPANY
IN THE NETHERLANDS**



POSITION IN THE VALUE CHAIN

Our Strategy – Facilitating the Energy Transition

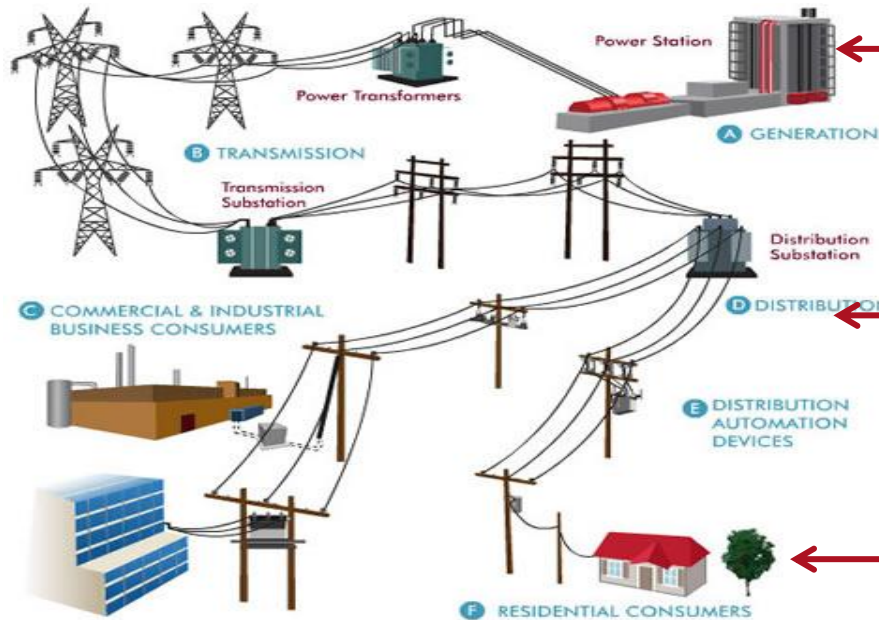


Continuously *improving*
Performance on service,
security of supply and
costs

Improving controlling
Energy Flows and **insights**
in energy usage

Engage Customers to save
energy and to **transite to**
renewable energy sources

The Current Energy Business Model – based on Planned Scarcity



**Scarcity on
Purpose and
by Planning**

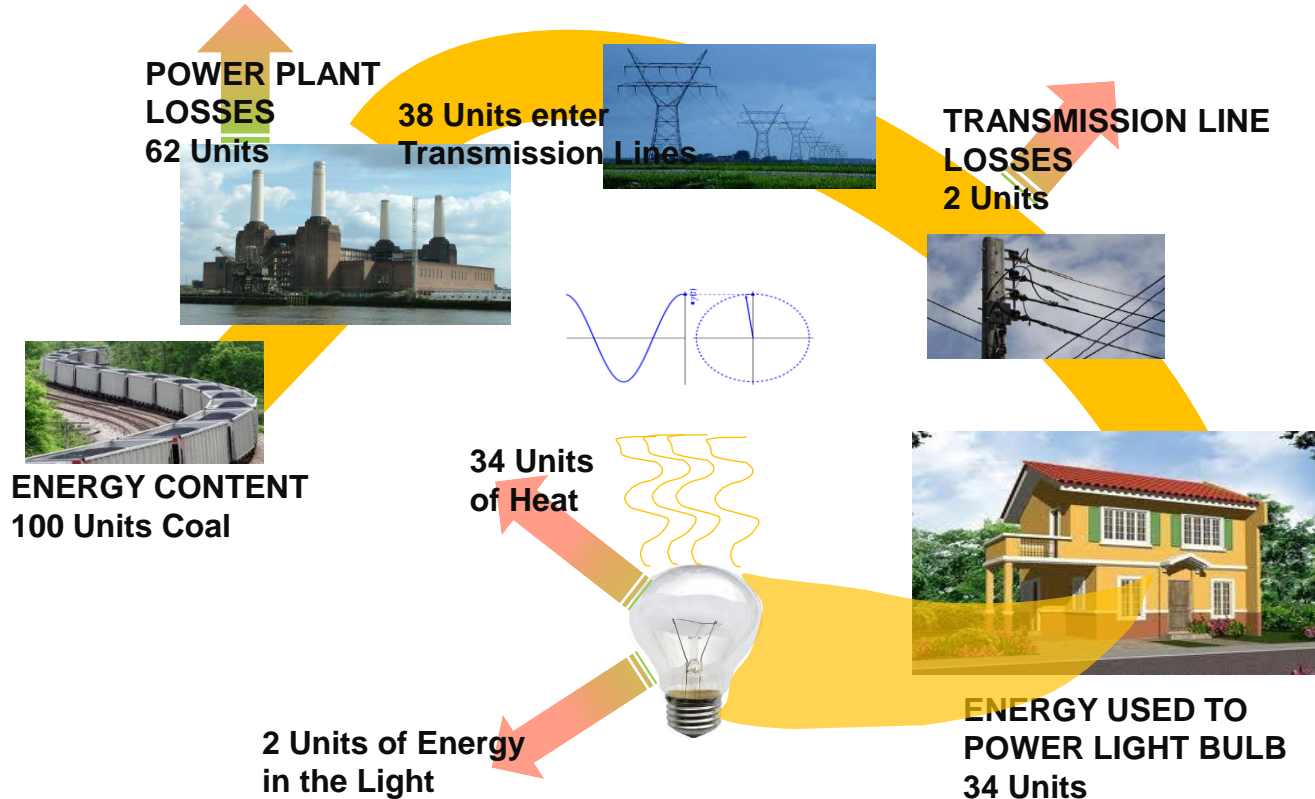
**Customer
=
Connection**

**Customers are
Cost Factor
and Base Load**

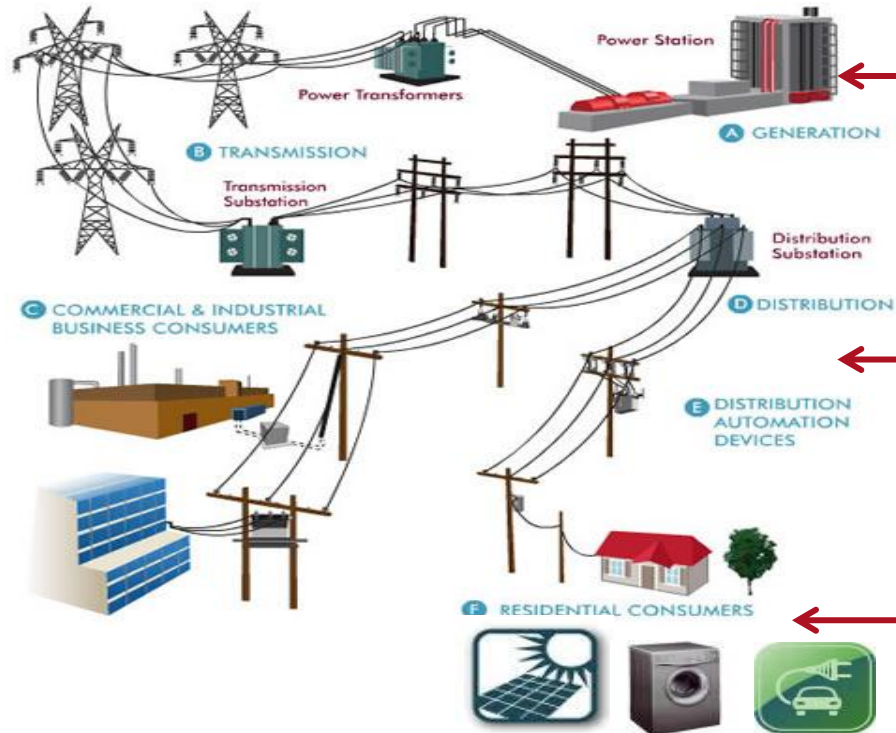
This model is NOT Sustainable

Bleeding at the Speed of Light

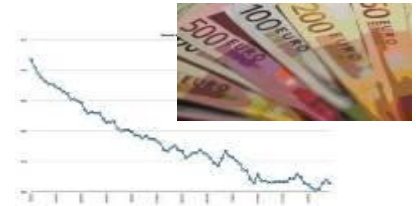
Energy losses in Powering a Light Bulb



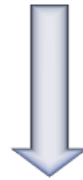
The NEW energy business model – based on Sustainable Balance



**Fuel mix
dependent on
Economics &
Politics**



**Consumers
become
Active
Participants**



**Customers are
Producers,
Consumers and
“Balancers”**

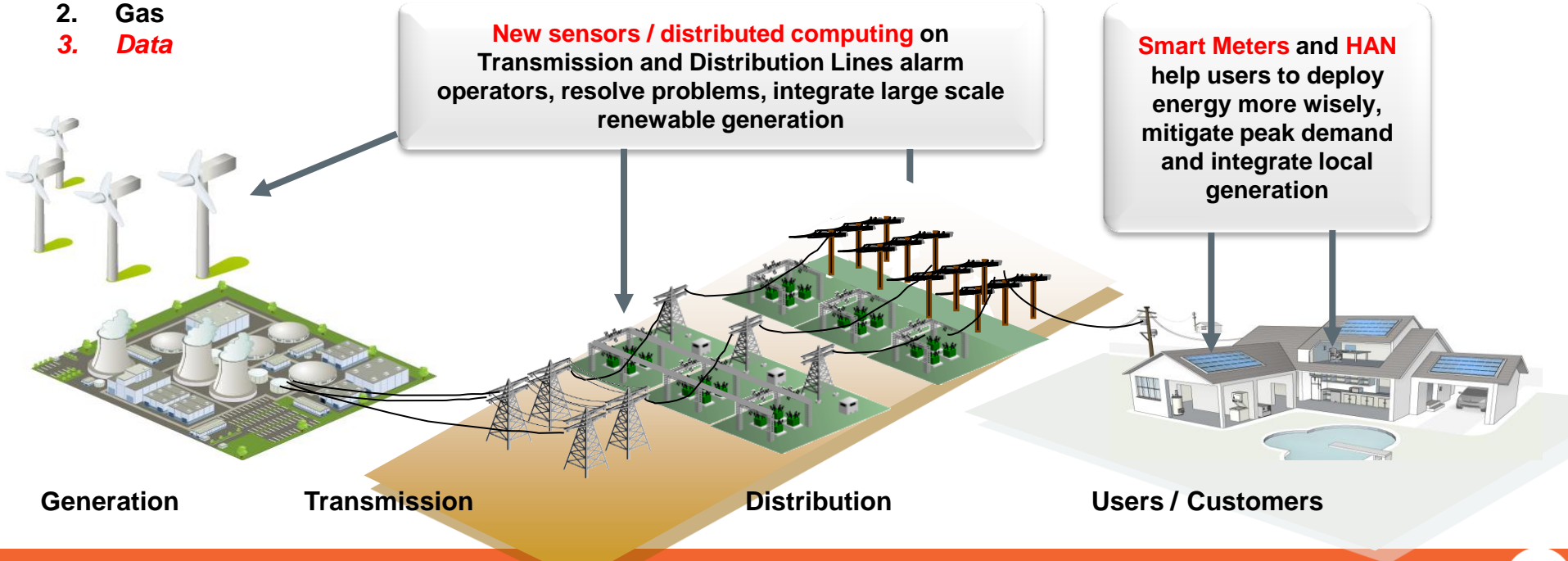


Vision –

Connect Customers (*Prosumers*) to Energy via Information-Intensive Network

The DSO's new grid world

1. Electricity
2. Gas
3. **Data**



Our Infrastructure will be based on Sensors

High Voltage Transmission Grid



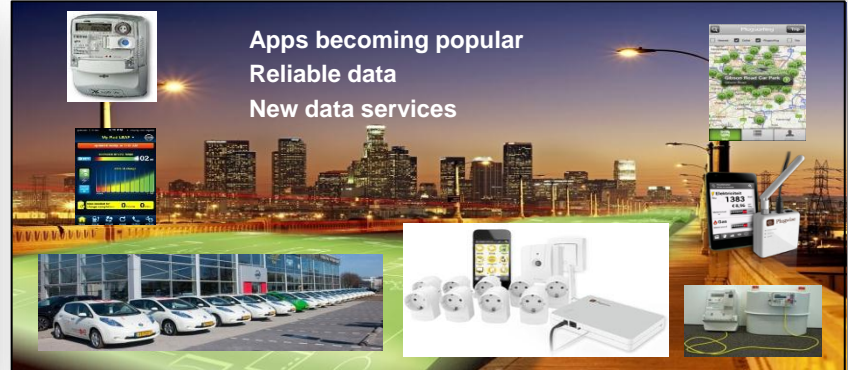
Gas Distribution



Medium Voltage Grid

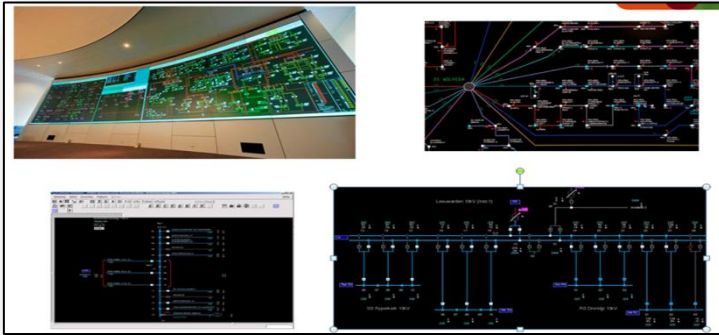


Consumers / Prosumers

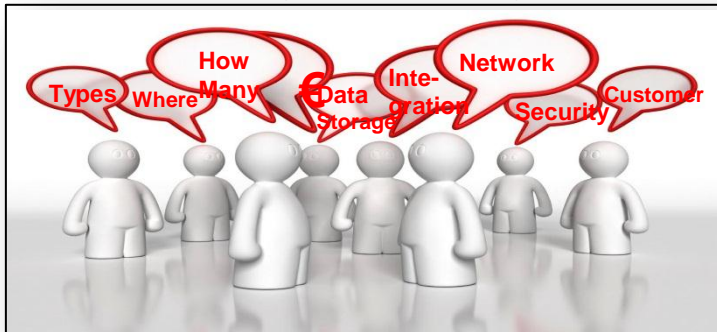


Strategic – Innovate with a pragmatic approach

New Control Concepts



Challenges on Sensoring



Need for a Platform

- Real World MV-Grid
- Realtime data
- Facilitates innovation
- Practice new concepts
 - Sensing
 - Control
 - Analytics



Design – Combine 4 i's



Instrumented

Sensing
Switches

Interconnected

Datacomm

Intelligence

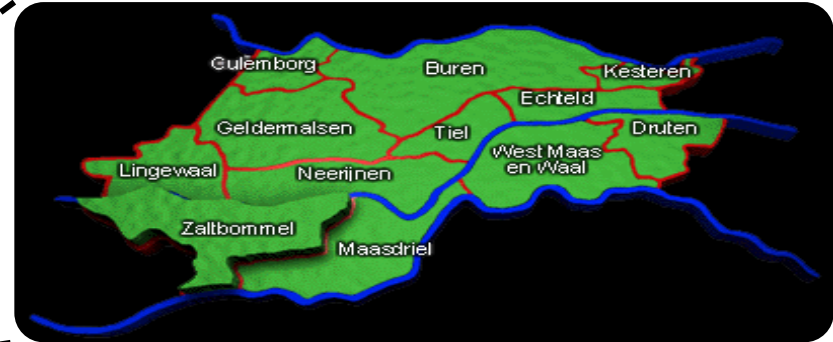
Information
from data

Innovation

Real life lab



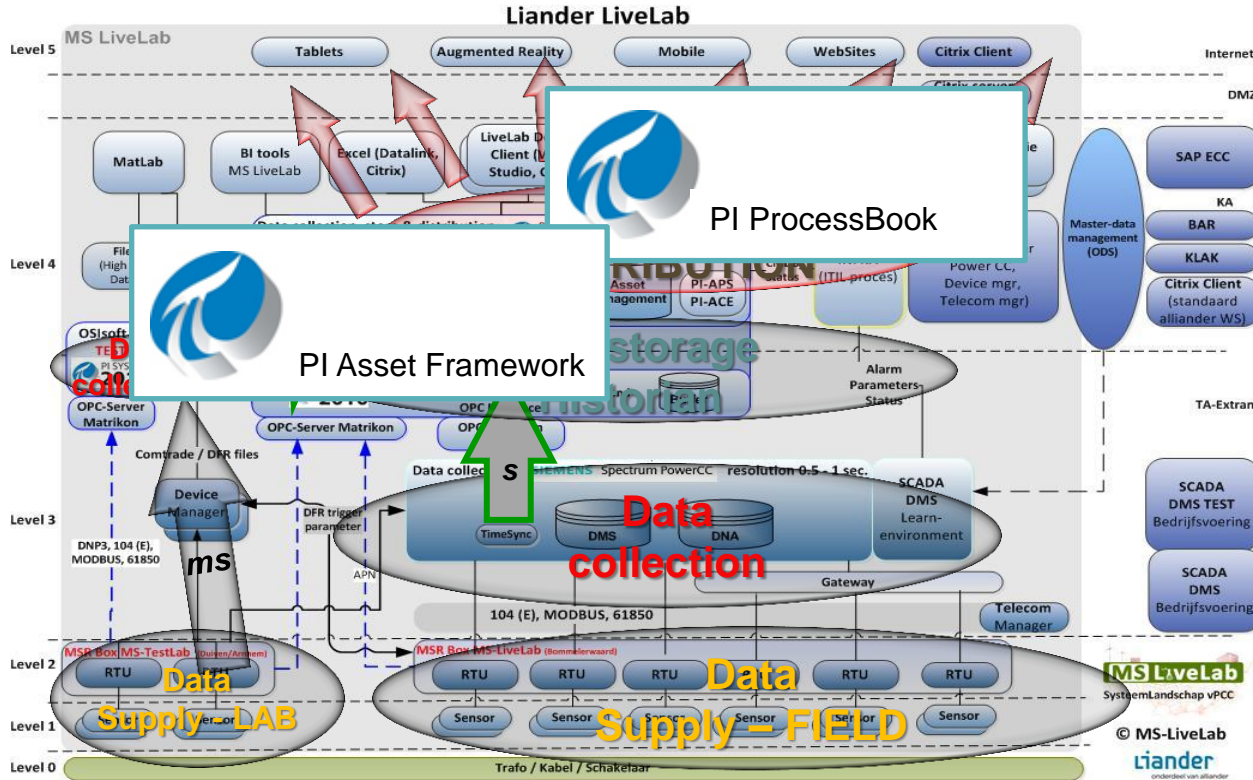
Result – our MV LiveLab



- End2End chain MV-LV
- In Real World grid with:
 - Electrical Vehicles
 - Decentral Generation
 - Homes (PV)
 - SME (Greenhouse industry)
 - Entire Residential Area

Architecture –

Livlab: Streaming data – Ready for adding value with OSISOFT



Use cases –

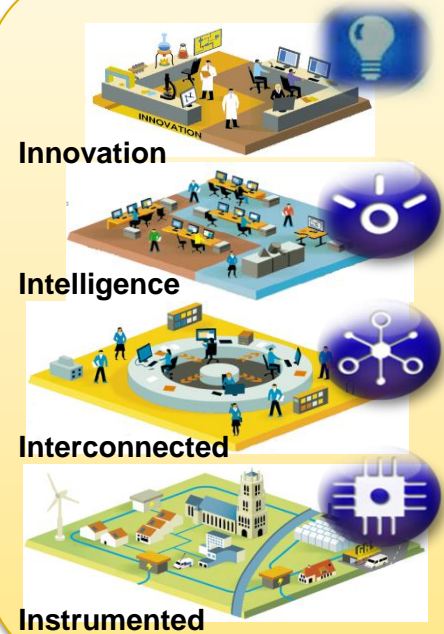
Live connection with Livelab

Service Monitoring

- Dashboard
- Hierarchies in PI Asset Framework (also Web Interface)
- Temporal view on data
- Service Management Proces (Calls)

Secondary versus Primary Asset-data hierarchies

- Data tags via ICT tree-perspective
- Data tags via topology of Grid
 - Interactive Web-browser Application
 - Realtime visualization App



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The Netherlands



THANK YOU

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