



Energy research Centre of the Netherlands

NL-Status DSM, DG, RES and Storage René Kamphuis, ECN/Intelligent Grids



DSM -> Demand Response // Demand side integration

- **Nationwide inventory of role of DR undertaken; potential estimated**
- **Increasing interest (also from retailers)**
- **SmartGrids is a definitive issue**
 - **Dutch task force installed**
 - **What does it exactly mean to every stakeholder**
 - **There will be a rollout to various testing areas**
- **Main drivers:**
 - **Energy replaces natural gas as energy carrier (heat pumps)**
 - **Local dispersed generation (e.g. micro-CHP)**
 - **Electric mobility**

DG-RES embedding in the Netherlands

- Long history of DG CHP and PV, favoured during '90s, subsidies stopped '00s; now breaking point to new opportunities
- First domestic transition technology is Stirling/CHP
- Smart Power Systems initiative (HR/E heater; E-production is 70 % of demand
 - Electricity and ICT network
 - Technology development and field-tests in progress
 - ECN in Stirling development Enatec -> Rinnai and Merloni
 - 'Smart' usage of natural gas
- SOFC/PV

- **SmartGrids**
- **Collect filtered information from most relevant projects worldwide**
- **Dual optimization goals (net management capacity (kW)vs. commercial goals (energy kWh));**
- **Conflicting interests and horizons (trade 1+ year; distribution management 30+ years) and how to cope**
- **Not only look at newly built infrastructures but also at renovation**
- **Grid level to 10 MVA; storage capacity related to grid losses**
- **Role of storage batteries (large and small)**

- **Relation to grid-planning (simultaneousness w.r.t. demand as compared to supply)**
- **Influence of DG-RES hotspots (in regions with ambitious DG implemented)**
- **Possible service models contract forms (behind the meter); in how far, what detail do we have to meter intelligently**
- **Business case for small customers in moderate climate regions**
- **Cost effectiveness of current technologies**
- **How important is smart metering; experiences with smart control**
- **Datapath and architecture in homes**

- **DG-RES and distribution tariffs (kW (t?) or kWh(t)); smart tariff differentiation; tariff schemes**
- **Demand differentiation ; lighting power, washing power, comfort appliance power**
- **User interfacing (technical behavior control or fully automatic); contract structures**
- **Legal consequences; responsibilities**
- **Prepaid vs. Monthly yearly bills; electronic billing**
- **Metering and link to factoring systems**
- **Experiences with bills -> Service contracts**
- **Cost savings at what point in value chain**
- **Profiling <> real-time prices**
- **What market type/design fits optimally to DR,DG-RES and Storage**