



Energy research Centre of the Netherlands

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



Progress

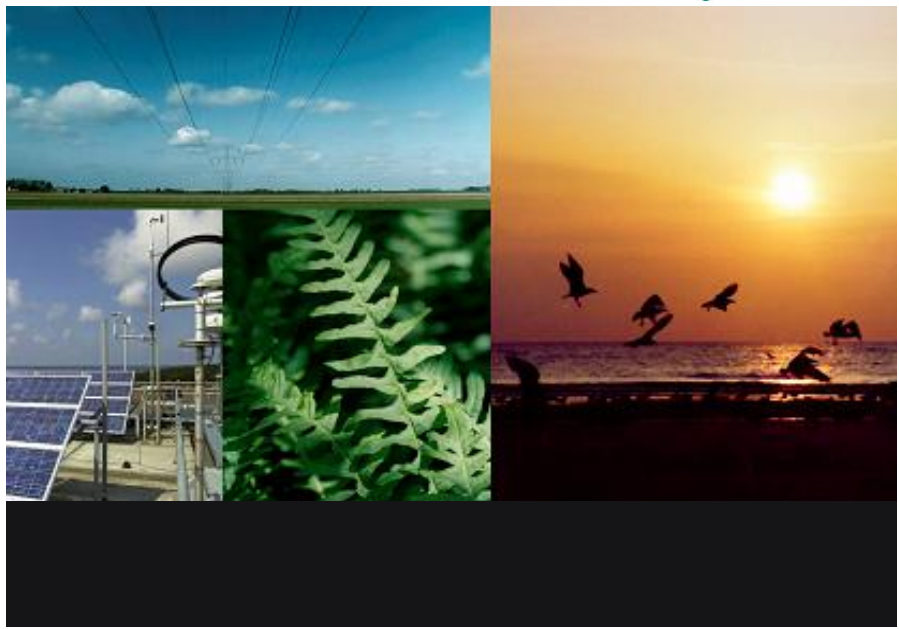
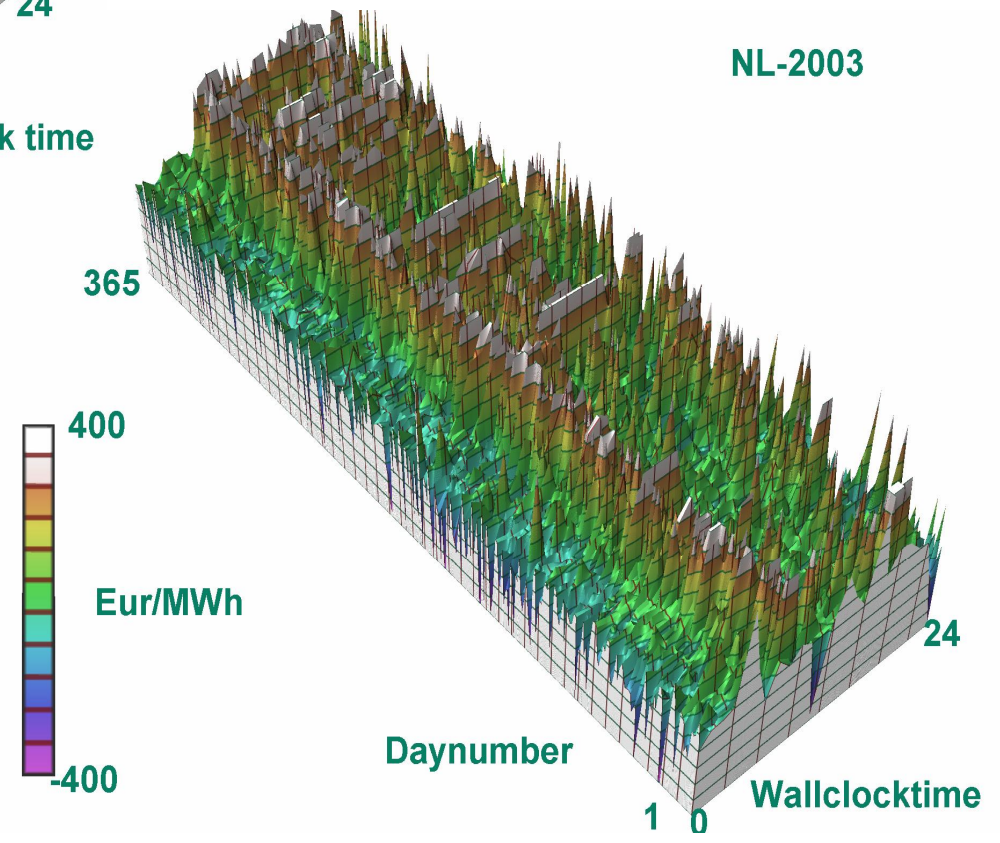
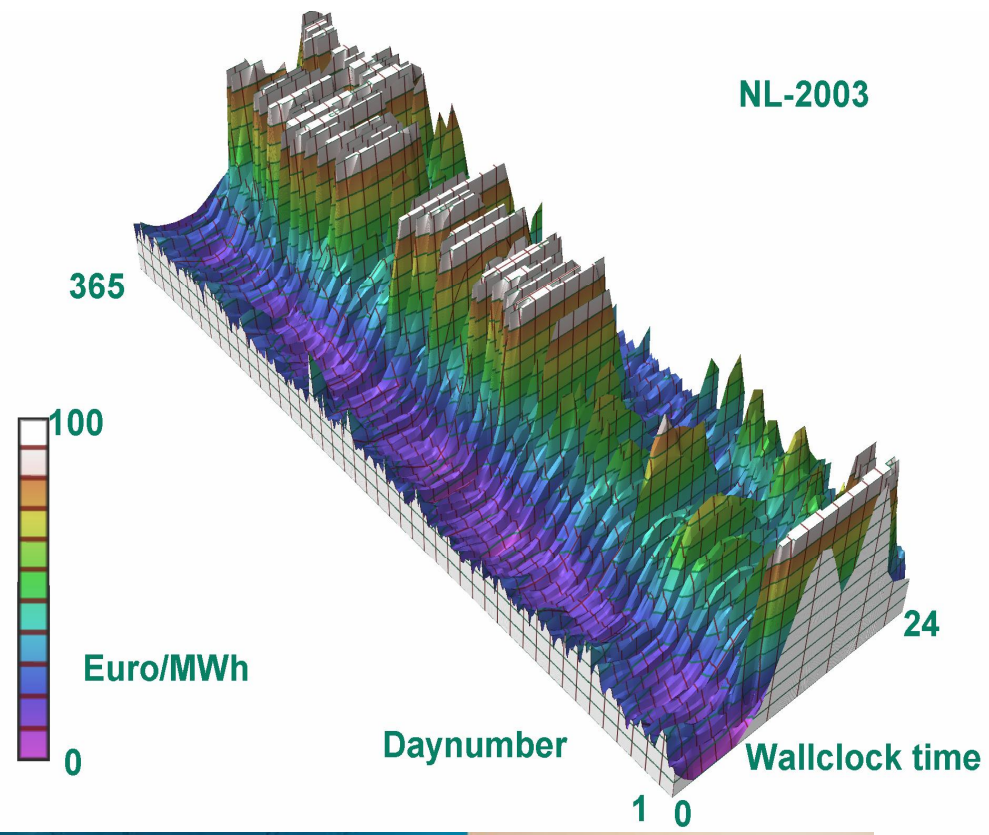
- **NL-country report**
- **Questionnaire**
- **Pilots**
- **Process**
 - **Plenary meeting 4 febr. 2008 Amsterdam**
 - **Bilateral meetings**
 - **NUON/Continuon**
 - **Essent**
 - **Eneco netbeer**

NL country report

- **Currently one of the most reliable in the world (ring network and no LV-overhead lines)**
- **Liberalised but not privatised**
- **Trade and distribution split**
- **Automated meter reading to be introduced (nta-2155)**
- **DG, RES, DR/RES drivers**
 - **Transition to renewable and durable development**
 - **Growing role of electricity as energy carrier**
 - **Ageing grid**
 - **More intelligent and active electricity system necessary as small customers became prosumers ->> new roles of stakeholders**
- **New markets for system services**

Marktdynamics APX/ Imbalancemarket

Netherlands



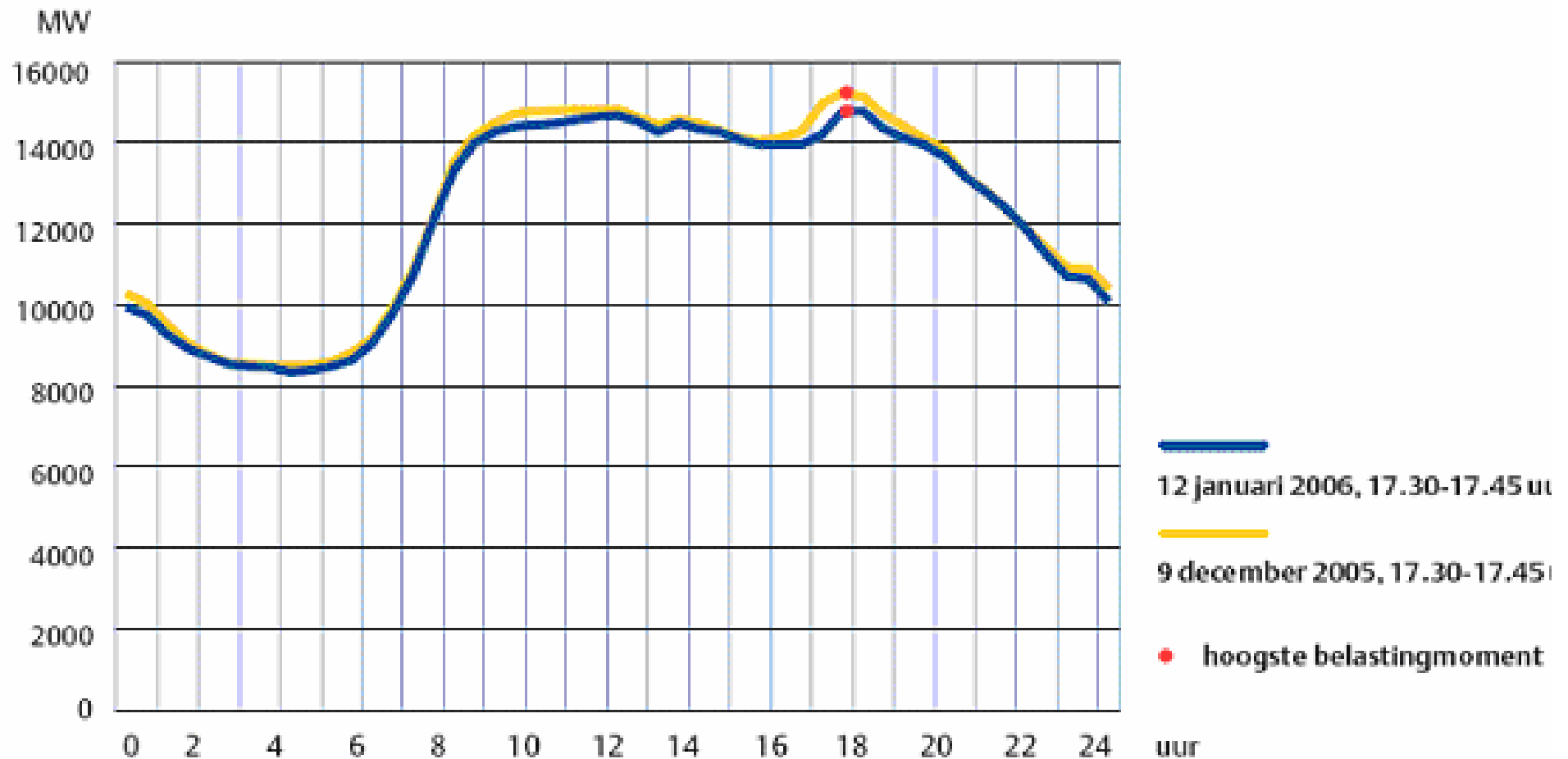
Macro-level changes

- **Efficient gas fired CHP as a transition technology; now 40-50 % of electricity**
- **Incorporation of increased proportion of offshore wind energy**
- **micro-CHP as a successor of the high-efficiency boiler (now in 6 million households)**
- **new PV-subsidy**
- **advanced storage at micro- and macro-level**
- **link to mobility applications**
- **scenarios to 2020 and 2030**

Possible storage possibilities on offshore island



Questionnaire: grid characteristics





ECN Questionnaire: transport (D -> NL -> B)

TenneT met de onderliggende netten).

De uitwisselingen zijn gemeten aan de secundaire zijde van de transformator op het overdrachtpunt. De gegevens tonen de situatie op het moment van de hoogste belasting in 2006.

- Maasvlakte
- | |
|------|
| -432 |
| -145 |
| 155 |
- balasting in MW
 blindvermogen in Mvar
 spanning in kV
- * transport naar 380 kV / 220 kV
 - transport vanaf 380 kV / 220 kV
- * per jaar 2006 in bedrijf



DG/RES, DSM and Storage Pilots/products

- **48 microgen/whispergen micro-CHPs meadow test**
- **CRISP fieldtest; use flexible loads and generation to accommodate wind imbalance in commercial cluster**
- **10 MicroCHP in households; LV cluster**
- **Plugwise; control and monitor household appliances via internet service model**
- **Qurrent -> Richard Branson contest winner (500000 Euro)**
- **Nightwind; use large cooling loads to accommodate wind imbalance**
- **Fenix VT-1 and -2**
- **PV-subsidy scheme**