Congestion Management by a Virtual Power Plant of 10 micro-CHP units at Consumer Premises

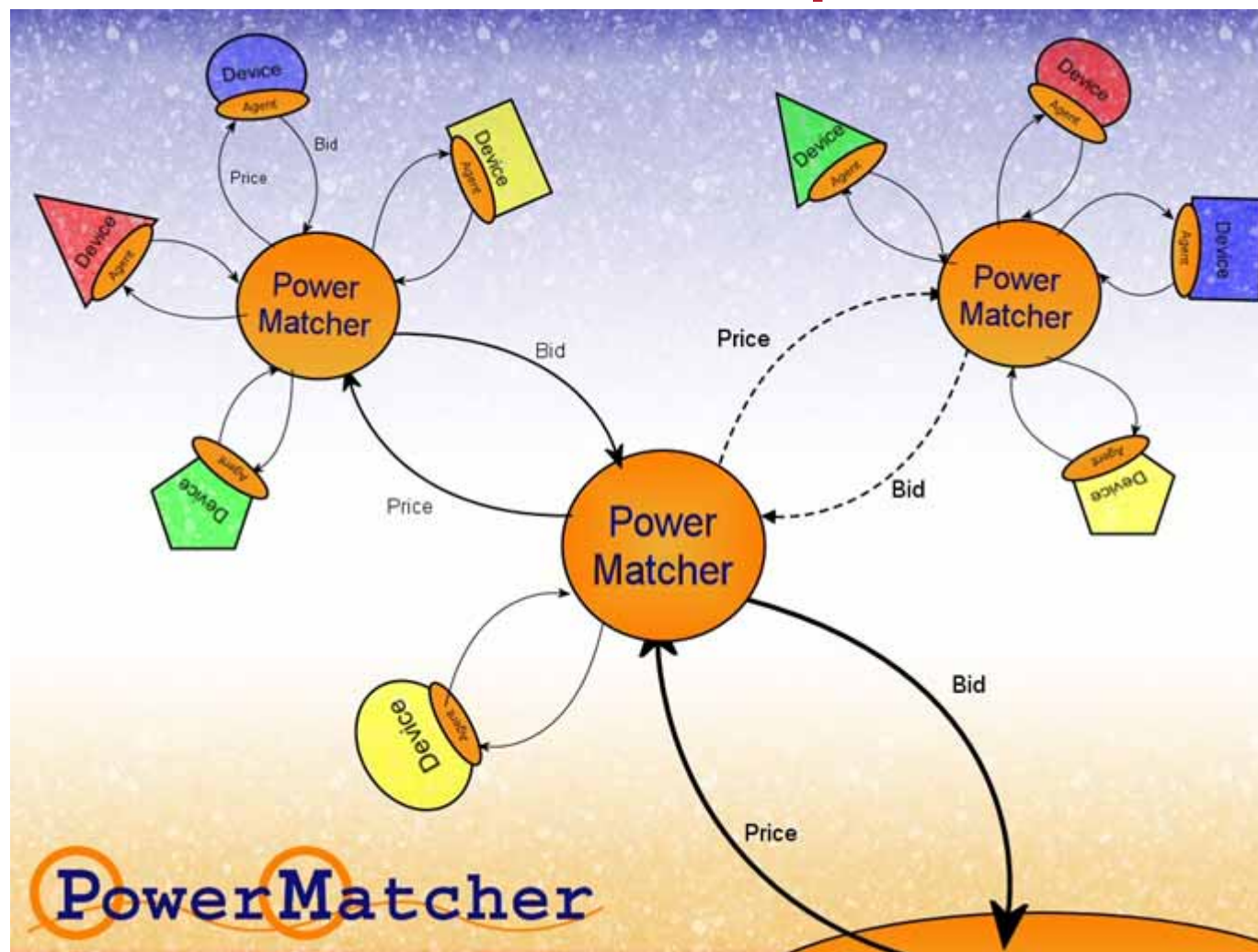B. Roossien, M.P.F Hommelberg, J.W. Turkstra, C.J. Warmer, J.K. Kok

Electricity grid evolution
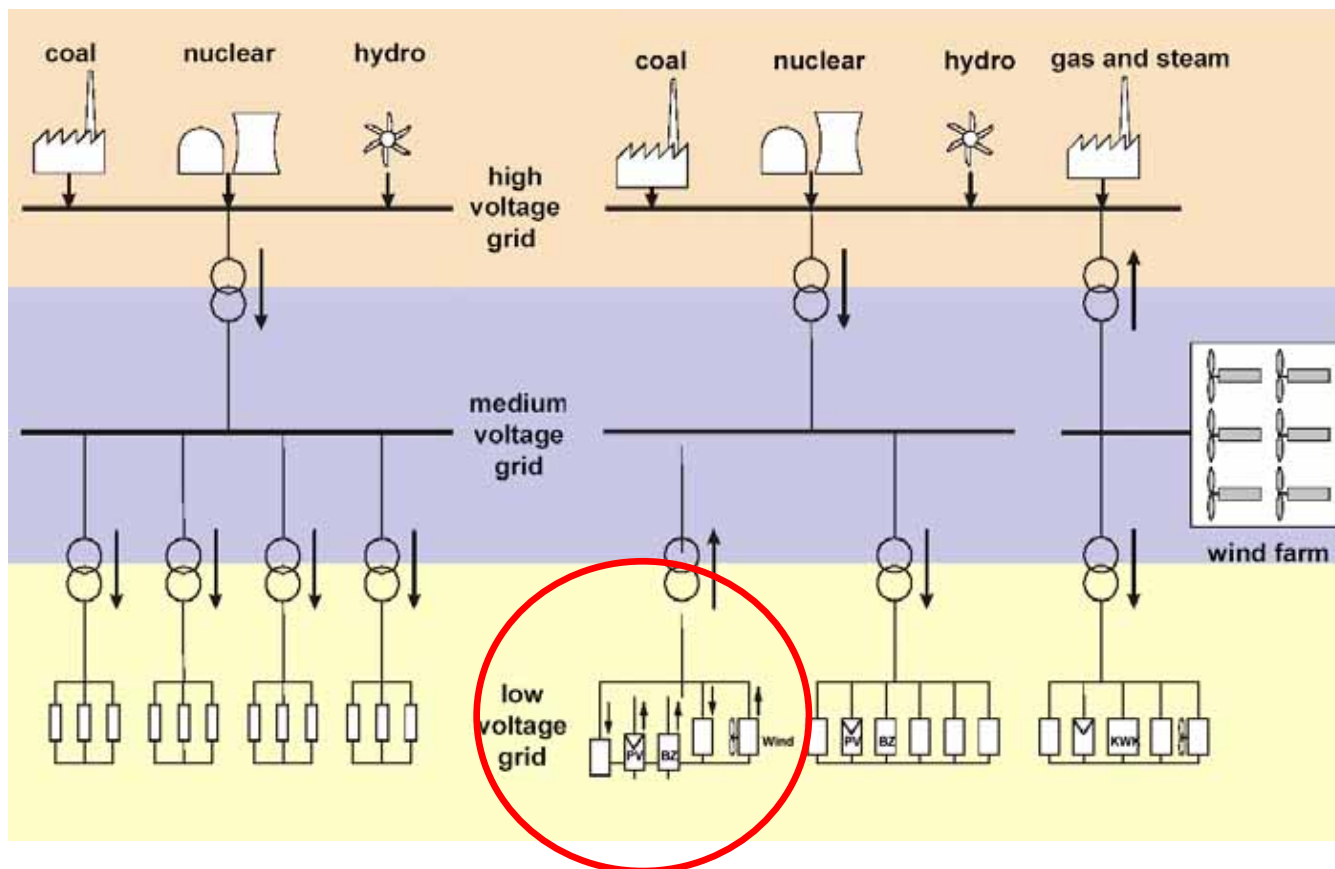
(Drawing courtesy of ISET)

Can we reduce peak loads with distributed generation at the local level?

The PowerMatcher concept

Micro-CHP Virtual Power Plant Field Test

- 10 households with micro-CHP

- PowerMatcher coordination

- Agents for thermostat control and micro-CHP operation

- Virtual Power Plant (VPP) for Active Network Management

Financed by:

Virtual Power Plant (VPP)
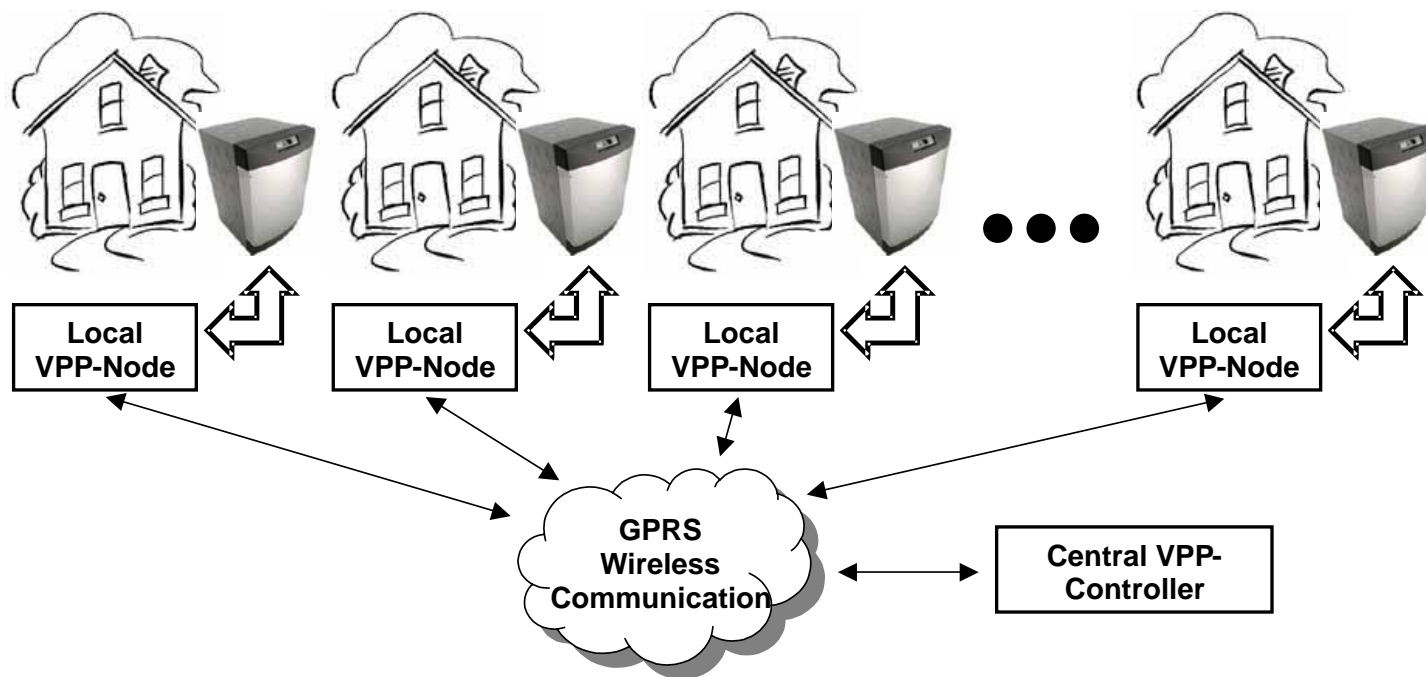
Control goal:
- Peak reduction at the common substation
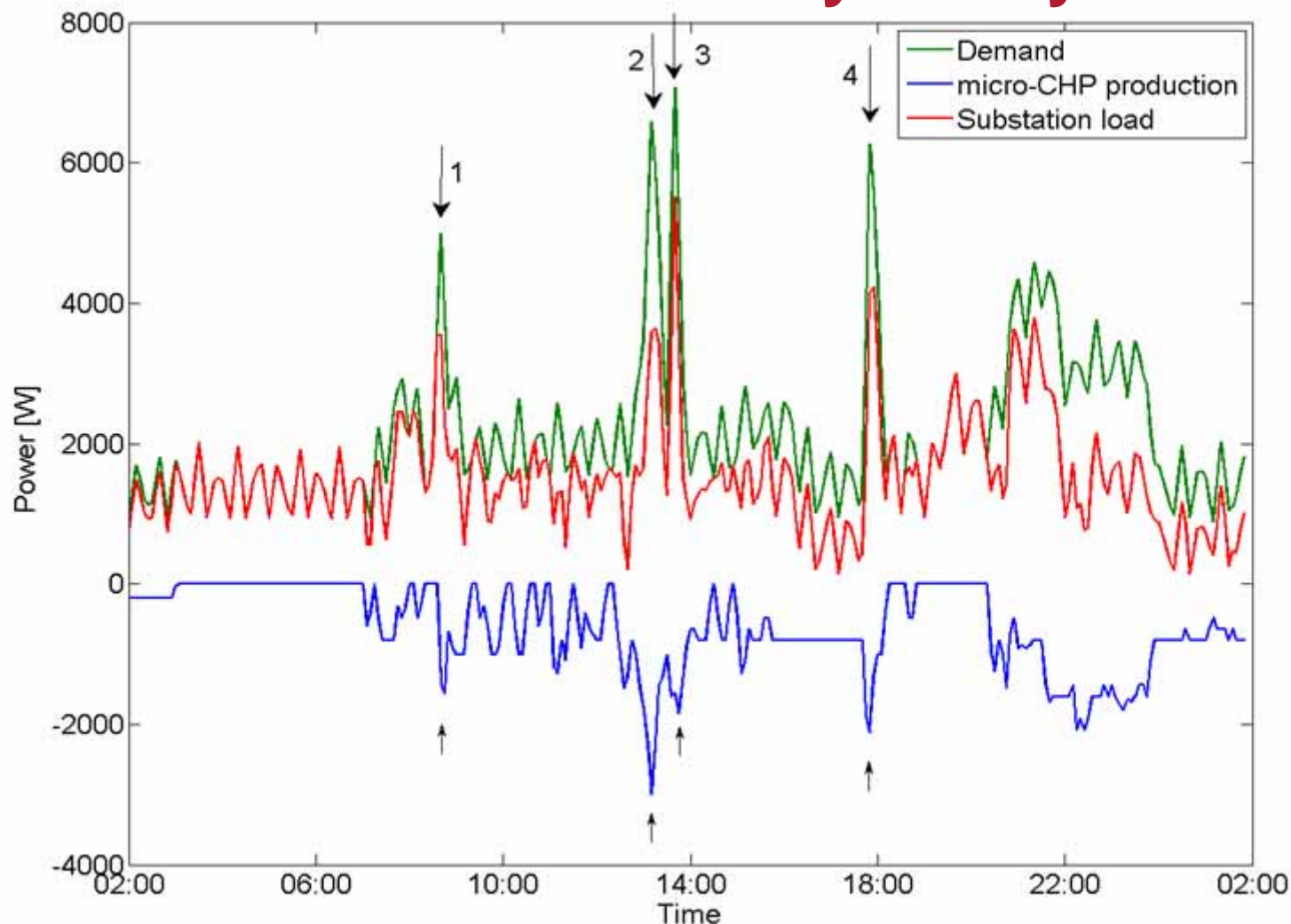- No infringement of user comfort
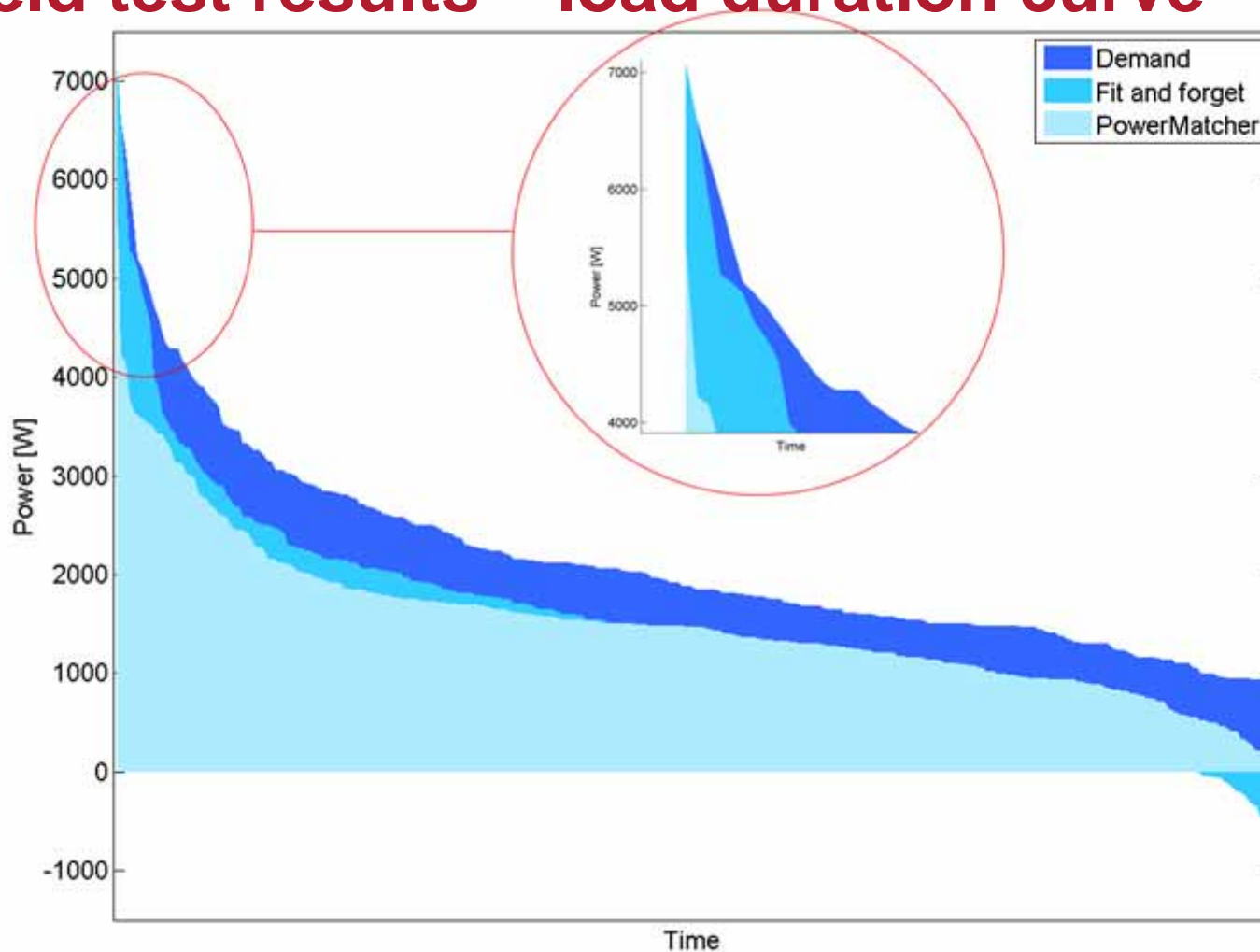
Field test design

- Locally:
  - VPP nodes
  - In-home power line communication
- Centrally:
  - PowerMatcher market node
  - Central database
- Wireless communication (GPRS)

- No loss of comfort
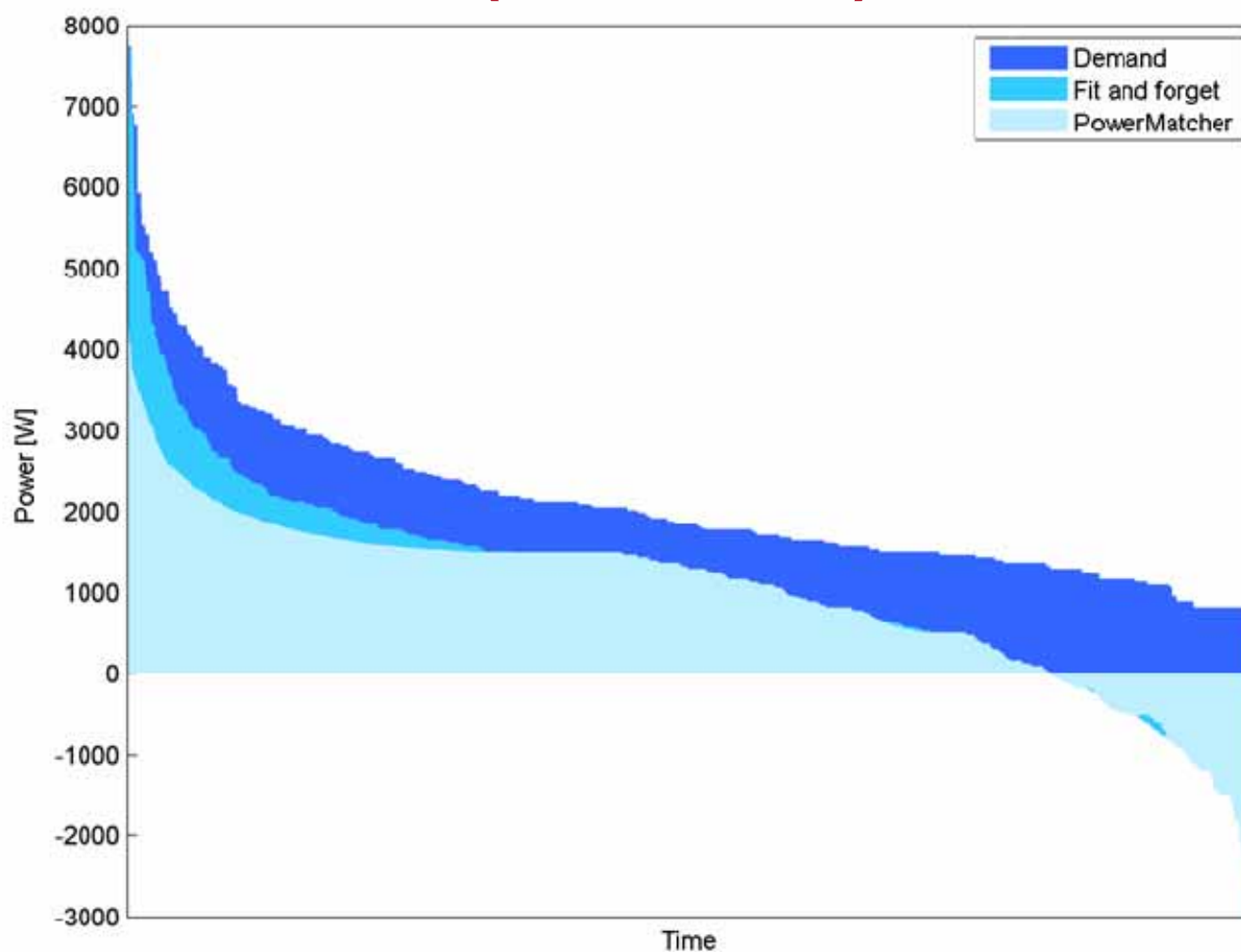- Back-up strategy

Field test results – one day in May 2007
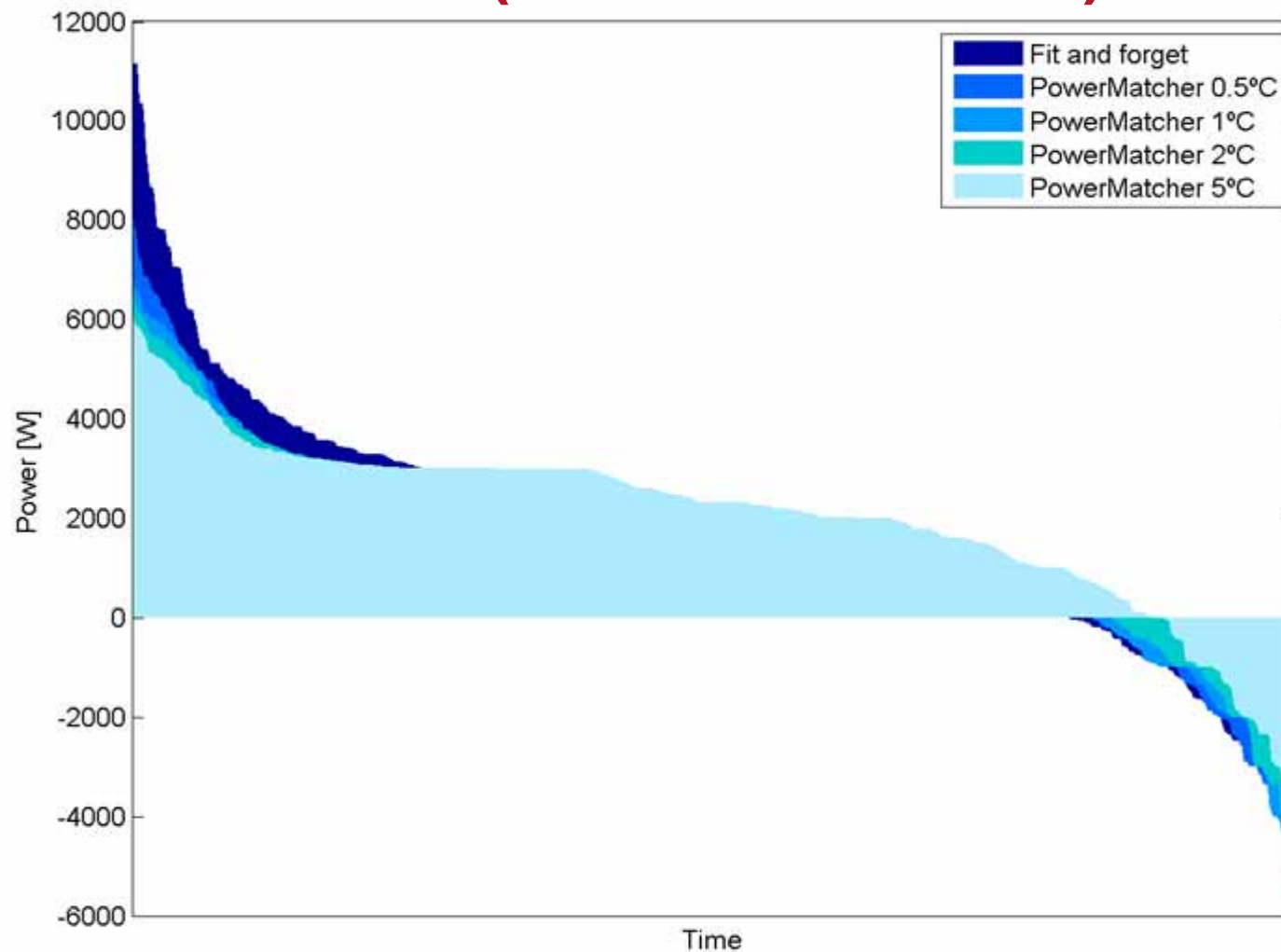
Field test results – load duration curve

Winter situation (simulation)

Setpoint deviation (winter simulation)

Field test – Conclusions

- Fit and Forget: Negligible peak reduction

- PowerMatcher: 30% - 50% peak reduction

- Negligible increase in gas consumption

- 7% increase in electricity production (booster)

Next steps

- Miniaturization **ICT** nedap

- Upscaling INTEGRAL

- Other flexible devices
  heat pump, storage (heat, power)

- Integration of network constraints
  and commercial operation

  fenix

Thank you for your attention

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