1. **Demand response demonstration at Skagerak Energi, Norway**

2. What is integrated with DSM

DG	☐
Energy storage	☒
Smart grid technologies	☐

3. What is the level of commercialization

Research project	☐
Demonstration	☒
Field test	☐
Existing practice	☐

4. Where to find more information?
   http://www.demandresponseresources.com/Portals/0/FinDRWS%20Kärkkäinen%20SeppoEFFLOCOM-SK.ppt

5. Objectives of the case
   - to avoid/expose planned grid reinforcement with use of DSM
   - learn about end-user behavior

6. Business rationale/model
   Resale of customer power that they didn't consume, to the spot market during high spot prices, and possibly to balancing mechanism or using it to reduce imbalances. Benefit to customers?

7. Technologies used
   Interrupt signal is sent by radio to so-called E-box, which includes radio receiver and relay to switch loads. E-box is simply plugged into normal electricity outlet, between the appliance and the outlet. It includes a switch, a radio receiver, a thermostat and a clock and could be configured through the internet (for example thermostat setting as function of time, if connected to electric radiator). Existing meters are used.

8. Short description of the case
   Residential customers (20 terraced houses) connect electric water heaters or electric radiators into the E-box, which allows direct control of loads. Certain availability was defined for customers, given as hours per day and year. The supplier could interrupt loads during high spot prices. Test period was 2 years.

9. Achieved/expected results (operational savings, CO_2, efficiency enhancement)

Profitability for residential customers is questionable because of the low annual profit compared to the price of the E-box.

10. Lessons learnt
    As could be expected, only a part of customers were enthusiastic about the experiment.