1. Microgrids

2. What is integrated with DSM

DG	[X]
Energy storage	[X]
Smart grid technologies	[ ]

3. What is the level of commercialization

Research project	[ ]
Demonstration	[ ]
Field test	[X]
Existing practice	[ ]

4. Where to find more information?
   http://microgrids.power.ece.ntua.gr/micro/default.php

5. Objectives of the case
   Create microgrids that interconnect DG, storage systems and loads. The microgrids are to be connected to the network or operated islanded.

6. Business rationale/model

7. Technologies used
   Agent platforms programmed with JADE

8. Short description of the case
   Microgrids comprise Low Voltage distribution systems with distributed energy sources, such as micro-turbines, fuel cells, PVs, etc., together with storage devices, i.e. flywheels, energy capacitors and batteries, and controllable loads, offering considerable control capabilities over the network operation. These systems are interconnected to the Medium Voltage Distribution network, but they can be also operated isolated from the main grid, in case of faults in the upstream network. From the customer point of view, Microgrids provide both thermal and electricity needs, and in addition enhance local reliability, reduce emissions, improve power quality by supporting voltage and reducing voltage dips, and potentially lower costs of energy supply.

9. Achieved/expected results (operational savings, CO_2, efficiency enhancement)
   Contribute to increase the share of renewables and to reduce GHG emissions.
   Study the operation of Microgrids in normal and islanding conditions.
   Optimize the operation of local generation sources.

Develop and demonstrate control strategies to ensure efficient, reliable and economic operation.
Simulate and demonstrate a Microgid in lab conditions.
Define protection and grounding schemes.
Define communication infrastructure and protocols.
Identify legal, administrative and regulatory barriers and propose measures to eliminate them.

10. Lessons learnt
    Microgrids are a possible paradigm for future LV power systems
    Distinct advantages regarding efficiency, reliability, network support, environment, economics
    Challenging technical and regulatory issues