

A) General Information



Acronym:

MSPC - 20110531-03

Title of the User-Project:

Microgrid Stochastic Predictive Control

TA Call:

4th Call of Proposals, 31st May 2011

Host Research Infrastructure:

Centre for Renewable Energy Sources and Saving, Dept. of PVs and Distributed Generation, DG Laboratory

Starting Date:

February, 23 2012

End Date:

March, 3 2012

Lead User (Name-Institution-Country):

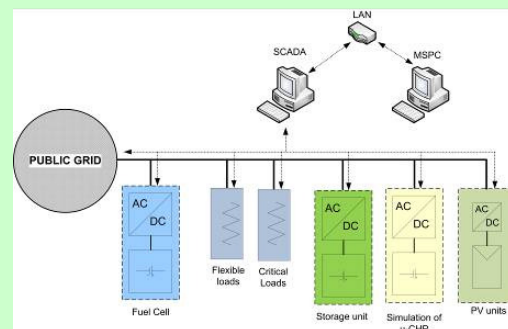
Alessandra Parisio, Group of Research on Automatic Control Engineering (GRACE), Università del Sannio, Dipartimento di Ingegneria-ITALY

Additional Users (Name-Institution-Country):

--

B) Summary of the User-Project

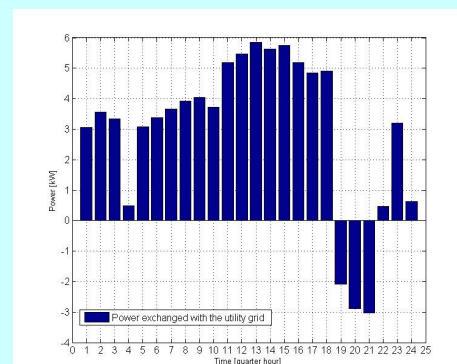
The proposed research aims at testing experimentally the benefits of applying a Model Predictive Control (MPC) approach to the problem of efficiently optimizing microgrid operations while satisfying a time-varying request and operation constraints. The proposed research is intended to be a continuation of the proposal SOCP-Microgrid, Stochastic Stochastic Optimal Predictive Control for Microgrids, which was carried out from 18 April 2011 to 20 May 2011.



Planned microgrid configuration

C) Main Achievements

- The control algorithm was found to be always feasible during the experiments
- The running costs increase significantly when the corresponding weight in the optimization problem is reduced significantly
- The corresponding decrease in emissions is not equally large. To obtain lower emissions, the weight factor on running costs should also be very low, almost zero. It is because the thermal load has to be necessarily satisfied through the thermal units, while electrical energy can be bought from the utility grid



Power exchanged with the utility grid (29/02)

D) Dissemination of the Results

Alessandra Parisio, Evangelos Rikos, Luigi Glielmo: "Microgrid Operation Optimization using Model Predictive Control" - IEEE trans. On Control Systems Technology (submitted for publication)

E) Use of the Resources

Nr. of Users involved: 1
Access Days: 5
Stay Days: 10