



Consortium for Electric Reliability Technology Solutions  
Berkeley 2005 Symposium on Microgrids  
June 17, 2005  
UC Berkeley Faculty Club, Berkeley CA



### Participant Contact Information and Research Activities

Name	<i>Jose Oyarzabal</i>
Affiliation	<i>Fundación Labein</i>
Contact Information	Email: <a href="mailto:joseoyar@labein.es">joseoyar@labein.es</a> Phone: +34 94 607 33 00 Address: Parque Tecnológico de Bizkaia Calle Geldo, Edificio 700 48160 – Derio (Spain)
<p>What is your working definition of a microgrid? How is it different from the following working definition?</p> <p>A microgrid is an integrated power delivery system consisting of interconnected loads and DER which, as an integrated system, can operate in parallel with the grid or in an intentional island mode. The integrated DER are capable of providing sufficient and continuous energy to a significant portion of the internal demand, and the microgrid possesses independent controls and can island and reconnect with minimal service disruption.</p> <p><i>I mostly agree with above definition but I miss some mention to the required communication infrastructure to allow the coordination of actions and commands sent to loads, storage and generation devices. Accordingly to the provided definition it seems to be just matter of primary regulation but some secondary regulation also makes sense.</i></p> <p><i>Some sources think of the microgrid as being able to feed the full load but on the short term it is completely unrealistic because of economic reasons although in a near future microgrids could play a relevant role when providing added value services, for instance: covering power supply interruptions to critical loads or improving power quality. An alternative motivation could come from environmental issues and sustainable development improvement over the current approach.</i></p>	

Briefly describe your research activities on microgrids.

*Within MicroGrids (EC supported, contract ENK5-CT-2002-00610) project we have been working on several issues*

- Demand Side Management design, data models, algorithms and evaluation over two different approaches: load shifting and curtailment.*
- Generation scheduling and secondary regulation.*
- Software agents and platforms. Developed software was initially oriented towards SCADA functions but modules for DSM, scheduling and secondary regulation were added at latter stages. All these functionalities have been already tested on laboratory microgrids (at ISET DeMoTec laboratory)*

Please note which of the following technical issues your research addresses (if any):

Intentional islanding and resynchronization	<i>No</i>
---	-----------

Protection within the microgrid	<i>No</i>
---------------------------------	-----------

Voltage control within the microgrid	<i>No</i>
--------------------------------------	-----------

Frequency control within the microgrid during islanded operation	<i>Yes</i>
--	------------

Fast load sharing among microsources (for load changes faster than the ramping rates of the prime movers)	<i>No</i>
---	-----------

Heat load matching and load prioritization	<i>Yes</i>
--	------------

Economic dispatch of assets	<i>Yes</i>
-----------------------------	------------

Meeting environmental constraints	<i>Yes</i>
-----------------------------------	------------

Other	<i>Labein distributed generation laboratory is under construction and already done research will be applied to the installed equipment. Micro sources (generation and storage) model testing and parametrization for integration into simulation tools.</i>
-------	---