

# Interview with the Barcelona's Opera House (LICEU)

Country: Spain

## General information

Item	
Organisation name	'Gran Teatre del LICEU' (Opera House of Barcelona)
Organisation type	Public Entity
Date of interview	17 <sup>th</sup> December 2013
Name of interviewed person	<i>Antoni Garcia</i>
Function of interviewed person	Chief of Infrastructures and Maintenance.

Potential project	
Facility (project title)	Integrated service for the Energy Management & Maintenance in the facilities of the Opera House (LICEU's Theatre) of Barcelona.
City, Region (site)	Barcelona
Type of customer	<b>Public</b> entity, which composition is: 45% Spanish Ministry of Culture 40% Generalitat of Catalonia 10% Barcelona's city council 5% Barcelona's provincial council.
Sector	Culture.
Goals of the project <i>(e.g. comprehensive reconstruction of the energy system during six months by implementing measures saving heat, electricity and water)</i>	Action Plan 2009 – 2015 to improve energy efficiency to obtain savings. This action plan was structured in 2 phases: 1. First: one year of Good Practises and Measure.(1y) 2. After: Investments and management. (5y)
Number of buildings of each type <i>(e.g. 25 schools, 11 healthcare facilities, etc.)</i>	Only one Opera house building in old centre of the city of Barcelona. Surface: 35.000 m <sup>2</sup> Opera room: 9.000 m <sup>3</sup> (2.400 persons)

## Interview

Question	Answer
What was the <u>impulse</u> to start thinking about realising an EPC project?	Requirement of sustainable financing: There was a need to implement energy efficiency improvements (chillers retrofit was urgent) without money available. They were aware of some experiences in EPC.
What would be the main reasons for your organisation for choosing an EPC project? <i>(remove not-valid answers and put remaining answers in order of decreasing importance)</i>	<ul style="list-style-type: none"> <li>• The possibility for <u>financing energy saving measures</u></li> <li>• Reduce costs and <u>demonstrate savings</u>.</li> </ul>
What are in your opinion the main <u>barriers</u> in the realisation of an EPC-project in your organisation? <i>(remove not-valid answers and put remaining answers in order of decreasing importance)</i>	<ul style="list-style-type: none"> <li>• EPC is an <u>unknown procedure</u>: Escos need training.</li> <li>• Other :</li> <li>• Sensation that the market is still not ready for the EPC.</li> <li>• Lack of knowledge applying M&amp;V</li> <li>• <u>Complicated tendering procedure under a PPP process</u></li> <li>•</li> </ul>
What is the expected size of the first EPC project in your organisation?	Number of selected buildings : 1 building Energy cost of the building: 824.393,62 euro/year(VAT excluded) (Electricity + gas + water) Potential investment volume: 1.300.000 euro Potential savings: Global value not evaluated. Only estimation for the refrigeration: 60 % (estimated by End User)
Other comments	<ol style="list-style-type: none"> <li>1. The key is in the <u>contractual definition of savings</u>. So there is a need of a very clear definition of M&amp;V Plan (under the contract!)</li> <li>2. EPC &amp; M&amp;V process: everybody knows <b>what</b> we have <b>to do</b>, but nobody knows <b>how</b> to do it.</li> <li>3. <i>Issue: how to manage the transfer of the contract to a new company at the end of the current contract.</i></li> </ol>

## Other information on the project

To fill in only available information

Timing of the project		From	Till
Project identification		2008	2009
Procurement procedure		March 2009	September 2009
Installation of energy efficiency measures		2010	March - 2011
Contract duration (guarantee duration)		2009	2015
Period of repayment ( <i>if the same, do not fill in</i> )		2010	2015
Contract duration [years]		6	
Project specifications			
Measures ( <i>short description – max. 5 points</i> )		<ul style="list-style-type: none"> <li>...Chillers retrofit: Implemented oil free magnetic chillers (high technology and efficiency)</li> <li>...New control system for the whole facility (BMS)</li> </ul>	
Total investment [EUR]		1.300.000 euros	
Co-financing of customer		No (100% financed by Esco)	
Initial energy consumption before the project (baseline)	Heat	[kWh <sub>gas</sub> ]	
	Cooling	[kWh <sub>t</sub> ]&kWh <sub>e</sub>	4.730.000 & 2.500.000
	Natural gas	[kWh]	1.038.425
	Electricity	[kWh]	9.000.000
	Hot water	[kWh/GJ]	
	Water	[m <sup>3</sup> ]	12.709
Total energy consumption costs before the project		[EUR]	824.393,62
Savings		Guaranteed(2009)	Achieved
Total savings		[%]	44%
Heat		[kWh]	
Cooling		[kWh]	40%
Natural gas		[kWh]	20%
Electricity		[kWh]	29%
Hot water		[kWh]	
Water		[m <sup>3</sup> ]	11%
Decrease of other operational costs ( <i>wages, maintenance, etc.</i> )		[EUR]	
Total guaranteed savings		[EUR]	



<p>If there are other important aspects of the project, innovations and client's advantages, not mentioned above, please, describe here</p> <p><i>(e.g. other type of cost saved, different form of financing such as leasing, exceptionality of the project, direct link to another energy efficiency project such as building insulation)</i></p>	<p>During <u>first year</u> contract savings achieved using Good Practises were: 9%.</p> <p>After implementation of measures total consolidated savings are of a 40%:</p> <p>Initial energy cost: 9.000.000 euro</p> <p>Present energy costs: 5.100.000 euro. That value is consolidated! (steady value not going back)</p>
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Energy data from the LICEU Opera House:

INVESTMENTS

  
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Service	Season 08-09	Season 09-10	Season 12-13	Variation 08/09 to 12/13
<b>HVAC (kWh)</b>	<b>4.730.000</b>	<b>4.221.680</b>	<b>1.631.962</b>	<b>-65%</b>
Chillers (kWhe)	2.500.000	2.363.691	493.014	-80%
Cold water production kWh <sub>cool</sub>		5.062.592	2.364.203	
Fans (kWhe)	1.150.000	979.520	618.180	-46%
Pumps (kWhe)	1.000.000	805.230	383.435	-62%
Other (kWhe)	80.000	73.239	137.333	72%%
<b>General Services (kWhe)</b>	<b>3.020.000</b>	<b>2.825.237</b>	<b>2.212.920</b>	<b>-27%</b>
<b>Scenic Lighting (kWhe)</b>	<b>900.000</b>	<b>892.613</b>	<b>875.905</b>	<b>-3%</b>
<b>Scenic Machinery (kWhe)</b>	<b>350.000</b>	<b>343.112</b>	<b>338.048</b>	<b>-3%</b>
<b>TOTAL (kWhe)</b>	<b>9.000.000</b>	<b>8.282.642</b>	<b>5.058.835</b>	<b>-44%</b>

