

# CODE 2

**Cogeneration Observatory  
and Dissemination Europe**



## *D7.1 Revised and updated performance indicators*

*December 2014*



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## **Key Project Indicators update CODE2**

### Discussion of Common Performance indicators and the calculations

#### Key Project Indicator comments at 2014

The CODE2 project supports that a strong potential for CHP growth exists in Europe and highlights the main barriers which remain for industry and policy to remove if CHP is to fully contribute to Europe's energy and climate objectives for 2020 and 2030. The project also highlights the need for a strong implementation of the EED, while indicating that this is unlikely to happen from current member state priorities and progress.

Between 2011 and 2014 the electricity market in the European Union has gone through several changes, and the prices of primary fuels have adjusted substantially. Both of these factors have adversely impacted the installed CHP base in the EU and put some of the existing base line used for establishing the key indicators in question.

The outlook for CHP for 2020 must be approached with caution while the 2030 outlook for CHP remains positive.

#### Baseline as originally foreseen

The baseline information used for CHP was the most recent estimate produced by DG ENER published in the working documents supporting the Energy Efficiency Directive, and for bio-energy the Renewables Directive and supporting documents. National Renewables Action Plans were used for the Bio-energy baseline.

DG Energy in its impact assessment for the EED suggests that the growth rate of CHP installed capacity (2004-2008) was 1.5% per annum across these years but zero in the last three of the ten years. An initial value of 1% growth per annum was used for the baseline which would lead (allowing for economic growth) to around an additional 6Mtoe primary energy savings per year using very conservative estimates of savings, through additional CHP growth across Europe in 2020 (max 4% pa growth in these years).

#### The targets were set for CODE2 using the following rationale.

The project could stimulate additional enquiries in micro-CHP. These replace condensing boilers in the built environment and would save 25,000 Toe/pa primary energy additional in this sector by end of project, assuming an additional 35k units installed pa. By 2020 with sustained interest in micro-CHP, savings would be 700,000 toe pa through 1.8 GWe installed at an investment of 6,000 EUR per kW.

Member States reports showed 25 GWe of bio-energy would be used in CHP by 2020. The project should accelerate that uptake process adding an additional 4.GW of bio-energy CHP to the projected baseline, which using German evaluation of installed CHP base where 1 GWe installed saved 1.3 Mt CO<sub>2</sub>, would save 5.2mt CO<sub>2</sub>. The average investment cost was assumed at 1,000 EUR per kWh.

On this basis by the end of the project with an accelerated growth rate reaching 10% pa compared to 4% BAU, an additional 11 Mtoes per year of energy savings could be experienced by having mobilised the CHP sector in industry. This anticipates CHP in 2020 would contribute an additional 17 Mtoes to Europe's energy savings in 2020 compared to 2012. This would also push Europe to achieve towards the higher end of the 15-25 Mtoe target identified for CHP savings in the EED impact assessment. The average investment cost per kW capital is assumed to be between 800 EUR and 1500 Euros.

The updated project indicators are in the table below.

Specific Objective(s) of your proposal	Key Outputs (products and services) including their quantification where appropriate	Work package(s)	Target Outcomes (with quantified SMART performance indicators)	Means of monitoring	Actual Outcomes during the project
1. Better understanding of key market and policy interactions around CHP	<ul style="list-style-type: none"> <li>7 critiquing workshops on awareness, policy approach and market opportunities</li> </ul>	WP4	<ul style="list-style-type: none"> <li>25-50 participants to each Workshop and agreed CHP actions list</li> <li>Contact with 27 national policy-makers on alternative CHP policy approaches and their response.</li> <li>10-15 potential user participants to each plants visits</li> </ul>	Signed participants lists Walk-through (in person or web-based) each Roadmap with key Member State stakeholders Signed participants lists	21-45 participants Signed participants list available Key policy makers at all events and engaged.
	<ul style="list-style-type: none"> <li>7 site visits to best practices plants</li> </ul>	WP4		Website monitoring	No site visit in 2 member states Participants list available
	<ul style="list-style-type: none"> <li>4 "How-to" guides on CHP for target sectors (food, paper, hospitals and</li> </ul>	WP3	<ul style="list-style-type: none"> <li>On-line "How-to" guides 1,000 downloads. Target</li> </ul>	Copies sent to 200 professionals per sector	Copies sent

	<p>commercial premises)</p> <ul style="list-style-type: none"> <li>30 additional best practise cases on CHP</li> <li>3 events in Brussels to interact with stakeholders on progress and results</li> <li>CODE2 project website</li> </ul>	WP6	<p>associations (incl. UEAPME) promoting "How-to" guide. 10 CHP projects linked to how to guides "How to" guides</p> <ul style="list-style-type: none"> <li>1,000 hits on new case studies</li> <li>50 participants to each Brussels event with positive evaluation overall</li> <li>10,000 hits on project website</li> </ul>	<p>Feedback from sector associations</p> <p>Website monitoring</p> <p>Signed participants list</p> <p>Meeting evaluation sheet</p> <p>Website monitoring</p>	<p>Sector associations engagement difficult</p> <p>Ob line tool created</p> <p>*753 views in 2 years</p> <p>*1196 Views of case studies</p> <p>2 events achieved at 50+ participants .</p> <p>Hits 14,000+</p> <p>Visitors 14,500+</p>
2. Add a bio-energy CHP and micro-CHP analysis to the Member State projections for CHP to 2020	<ul style="list-style-type: none"> <li>Report potential of micro-CHP</li> <li></li> <li></li> <li></li> <li>Report potential of bio-energy CHP</li> <li>27 national CHP potentials estimates explicitly including bio-energy CHP and micro-CHP</li> </ul>	<p>WP2</p> <p>WP2</p> <p>WP2 and WP5</p>	<ul style="list-style-type: none"> <li>Awareness of micro-CHP in pilot Member States doubled. Awareness of micro-CHP in all Member States heightened.</li> </ul> <p>Awareness of bio-energy CHP in pilot Member States doubled. Awareness of bio-energy CHP in all Member States heightened.</p> <ul style="list-style-type: none"> <li>Inclusion of bio-energy CHP and micro-CHP in Member State energy efficiency planning/renewables</li> </ul>	<p>COGEN member Manufacturer enquiries</p> <p>COGEN member Manufacturer enquiries</p> <p>Direct feedback from member state responsible</p>	<p>Ativitey relatively flat in the all member states</p> <p>8 Leading boiler manufacturers have added fuel cell micro CHP to portfolio along with engines.</p> <p>Bio energy increased to 16% of CHP fuel in 2013.</p> <p>Bio enquiries unchanged</p> <p>Clear indications through reporting patterns that micro and bio will be included as required.</p>

			<p>planning (all 27 Member States)</p> <ul style="list-style-type: none"> <li>▪ Explicit reference to bio-energy CHP and micro-CHP in 50% of NEEAPs</li> </ul>		<p>CHP not included in reporting until 2017.</p>
<p>3. Propose a concrete route to realising Europe's CHP energy efficiency potential</p>	<ul style="list-style-type: none"> <li>▪ 27 actionable National Cogeneration Roadmaps</li> <li>▪ Presentation to and discussion with key actors from the 27 Member States: national government energy contacts, regulators, industry representatives, users.</li> </ul>	WP2	<ul style="list-style-type: none"> <li>▪ CHP policy improvement discussion in 50% of Member States</li> <li>▪ On-track transposition of the EED proposals on CHP</li> <li>▪ CHP policy improvement recommendations part of review of MS heating and cooling plan discussion 2014</li> </ul>	<p>National COGEN Associations feedback</p> <p>National experts feedback</p> <p>National Heating and Cooling plans under EED</p>	<p>All National Roadmaps completed, with MS discussions and circulation</p> <p>Policy discussion ongoing in UK, D,Dk,It,Sp,P,Gr,CY,, Ro, Bu, Cz, SI, LV, LT, Be,</p> <p>Article 14 exemptions: on time</p> <p>Article 14 CBA:</p> <p>CODE2 presented interim findings and resource to Concerted Action April 2014</p> <p>Roadmap and policy report produced and delivered as target.</p> <p>Sent to all members of ITRE Committee with follow up request</p> <p>8 MEP one –on-one</p>
	<ul style="list-style-type: none"> <li>▪ Production of European Cogeneration Roadmap</li> <li>▪ European Cogeneration Roadmap delivered to 15 Permanent Representations in Brussels, 20 MEPs and the EC</li> <li>▪ Presentations at 3 major conferences</li> <li>▪ European policy report with</li> </ul>	WP5			

	recommendations				meetings Presentation committed :COGEN Europe annual conference May 20, All Energy May 2015, EUSEW June 2015. (TBC)

• **Strategic Objectives and Long-term outcomes beyond the duration of the action until 2020:**

Strategic Objective(s) of your proposal		Expected outcomes by 2020	
1. Improve the effectiveness of policy measures around CHP in Europe		<ul style="list-style-type: none"> <li>▪ Simplification of policy structure around CHP policy in 70% of Member States</li> <li>▪ New policies reflecting best practises identified by Roadmaps</li> <li>▪ CHP growth in all Member States with identified CHP potential</li> </ul>	<ul style="list-style-type: none"> <li>▪ CODE2 stimulated clarification of interpretation of EED for CHP</li> <li>▪ Main policy barriers identified in all member states</li> <li>▪ Best Practis policy identified and well documented.</li> <li>▪ Sweet spots in market identified modest growth with good EED implementation</li> </ul>
.2. Add a bio-energy CHP and micro-CHP analysis to the Member State projections for CHP to 2020		<ul style="list-style-type: none"> <li>▪ Suitable policy measures for micro-CHP in place in relevant Member States</li> <li>▪ Micro-CHP sector at 50% of new boiler sales in target Member States</li> <li>▪ Suitable policy measures for bio-energy CHP (compared to bio-energy heat only or electricity only) in place in relevant Member States</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good micro support in ( prioritised) Germany, UK ,Italy</li> <li>▪ Product cost identified as main hurdle to market growth.</li> <li>▪ Changes are being considered to policy in several member states.</li> </ul>

		<ul style="list-style-type: none"> <li>▪ Bio-energy CHP at an additional 4GW by 2020</li> <li>▪ 2 large manufacturers offering significant bio-energy product lines</li> </ul>	<ul style="list-style-type: none"> <li>▪ The CODE 2 analysis confirms the member state projections. Greater growth requires fuel supply chain development.             <ul style="list-style-type: none"> <li>• The manufacturers offering bio-energy product ( ie steam turbines) include Siemens and GE . In 2013 66% of sales were in the steam turbine sector , indicating solid fuel.</li> </ul> </li> </ul>
3. Propose a concrete route to realising Europe's CHP energy efficiency potential		<ul style="list-style-type: none"> <li>▪ Key industry sector penetration of CHP increased by 20%</li> <li>▪ CHP installation growing 10% pa (2020)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Key industries of SME's, Food, hosptias and hotels growing strongly could achieve 20% increase in units (&lt;1MW) installed by 2020,</li> <li>▪ The modelling suggests ( given current electricity market changes ) that the CHP could grow between 5% and 10% towards the end of the next 6 year period ie around 2020.</li> </ul>

• IEE Common performance indicators:

Specific and strategic objective	Target within the action duration :	Actual	Target by 2020:	Estimated 2020
Contribution to the EU 2020 targets on energy efficiency and renewable energy sources	Doubling of installation of main market micro -HP saving 25,000toe /95,000t CO2	Micro market is flat .  CODE2 identified considerable potential but need for manufacturers to reduce product cost before growth	Micro-CHP at 1.8 GWe installed saving 700,000 toe 2.5mtCO2	With good implementation of EED ,and support to get to volume, CODE2 estimates that by 2020 240MWe-300MWe micro will be installed
	Bio-energy CHP new project proposals triggered by workshops	Interest shown in bio at all workshops  2013 bio-fuel in CHP reached 16% from around 11% in 2009/2010	Member States targets achieved with an additional 4.0 GWe bio-energy CHP installed (5.2mt CO2 saving)	CODE2 supports that the member state targets will be achieved. The range covers some additional growth depending on the quality of implementation of EED.
	CHP average growth at 3% additional saving 1.1 Mtoe and 4.3 Mt CO2 saving pa	The larger operators in the CHP market have been hit by changes in the electricity market and fuel prices . CHP generated electricity declined 375.5 TWh to 373.32 TWh1 there is now a risk or permanent loss of CHP capacity in some installations	CHP growth 10% (additional 11 Mtoes 41 Mt CO2 compared to BAU) Additional 47 GW i.e. half of identified Member States potential	With strong implementation of EED the CODE 2 roadmaps project that CHP growth could be between 5% - 10% oer annum in 2020.  The targets listed are within range.