

## Executive Summary

Combined heat and power (CHP) represents a series of proven, reliable and cost-effective technologies that are already making an important contribution to meeting global heat and electricity demand. Due to enhanced energy supply efficiency and utilisation of waste heat and low-carbon renewable energy resources, CHP, particularly together with district heating and cooling (DHC), is an important part of national and regional GHG emissions reductions strategies.

However, while some countries have been able to achieve a high share of these technologies, most countries have been much less successful. Policy makers and industry are investing in policies and measures that increase the use of CHP and DHC as part of a larger portfolio of energy technology solutions. This report attempts to guide them by quantifying the associated energy, economic and environmental benefits that might result from greater use of these technologies. This report will be followed by a second report later in 2008 which will identify global best practice policies for CHP and DHC.

The report confirms that CHP merits a closer look by policy makers as they investigate paths toward a lower-carbon, more efficient, lower-cost and reliable energy future. Some key results of the analysis include:

- CHP can reduce CO<sub>2</sub> emissions arising from new generation in 2015 by more than 4% (170 Mt / year), while in 2030 this saving increases to more than 10% (950 Mt / year) - equivalent to one and a half times India's total annual emissions of CO<sub>2</sub> from power generation. CHP can therefore make a meaningful contribution towards the achievement of emissions stabilisation necessary to avoid major climate disruption. Importantly, the near-term reductions from CHP can be realised starting today offering important opportunities for low- and zero-cost GHG emissions reductions.
- Through reduced need for transmission and distribution network investment, and displacement of higher-cost generation plants, increased use of CHP can reduce power sector investments by USD795 billion over the next 20 years, around 7% of total projected power sector investment over the period 2005 - 2030.
- If the energy saving and capital cost benefits of CHP are allocated to its electricity production, growth in CHP market share can slightly reduce the delivered costs of electricity to end consumers. This is contrary to the common view that CHP and other decentralised energy solutions result in higher electricity costs to consumers.
- The specific potential identified for each country varies widely depending on different national circumstances and opportunities. For example, Brazil, a largely hydropower-based economy, is not expected to see such high growth as Germany, which is likely to be more dependent on fossil fuels and biomass. More work is needed in the Plus Five countries (Brazil, China, India, Mexico, South Africa) in particular to analyse the potential for CHP expansion.

Based on these results, this report recommends the following next steps:

- Document and share specific best-practice CHP policy examples with a global audience, taking into account the different requirements of CHP with DHC, industrial CHP and buildings-based CHP;
- Convene groups of energy, environmental, economic and utility regulatory policy makers to better understand their needs as they attempt to invest in these technology solutions;
- Communicate the benefits of CHP/DHC expansion, and best practice approaches, to a variety of government and industry audiences; and
- Further analyse potential for growth in the Plus Five countries, to guide future development in these fast-growing areas with significant CHP/DHC potential.