

22 March 2010

## Siemens Announces Technology Blueprint to Solve Australia's Water and Energy issues by 2030

- *Siemens recommends Australia invests AUD\$60billion over the next 10 years in renewable and low CO2 generation technologies, and AUD\$23billion over the next 10 years in water infrastructure technologies to make water available for the increasing population*

**Melbourne, 22 March 2010, World Water Day:** Siemens Ltd, a leading provider of global technology-based solutions<sup>1</sup>, today released the findings of a comprehensive research project and presented a technology blueprint for energy and water sustainability in Australia by 2030.

The research, titled *Picture the Future: Australia – Energy and Water (PTF)*, is the first research in Australia focussing on technology as the enabler for a sustainable future. It is the culmination of work done in Australia and Germany involving numerous Siemens researchers and a validation process with 22 of Australia's leading industry bodies including the CSIRO, ABARE, the Bureau of Meteorology, The Clean Energy Council, University Technology Sydney, The University of Newcastle, Monash University, Parsons Brinckerhoff, South East Water, and The Warren Centre for Advanced Engineering.

Siemens Australia representatives led by Chairman and MD, Albert Goller, presented the research findings at an event in Melbourne, together with Paul Graham from the CSIRO and Chris Davis from UTS.

Albert Goller explained how Australia's challenges can be overcome by technology: "We have many enviable opportunities in Australia such as our abundance of natural resources, and Australia has the potential to be at the forefront of technology. Even the possibility of being a net exporter of clean electricity is realistic for Australia. Implementing technologies will not only help create a sustainable future, but also new skills and job opportunities in remote regions, whilst providing economic growth."

Mr. Goller outlined how an investment in infrastructure will provide a future where Australia has no water crises with regards to urban and rural supply; "We have the technology to ensure water is always available in urban areas; we can assist Mother Nature in restoring natural inland water resources; and we can ensure our crops feed the growing population through best practice farming and irrigation."

He has a similar vision for Australia's energy future, "I picture a future where Australians use and export clean electricity due to the integration of our electricity grid in Australia and possibly even South East Asia. I also picture a future where Australians are committed to energy efficiency as a way of life, even in the way we travel."

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<sup>1</sup> Siemens Australia provides global technology-based solutions in water, energy, environment, healthcare, productivity, mobility safety and security

Commenting on the significance of the research, Paul Graham from the CSIRO said: "Siemens' *Picture the Future* research provides valuable targets for using Australian-based greenhouse gas abatement options in the energy and transport sectors that simultaneously enhance our industrial base while addressing climate change. It helps us imagine how we can transform our electricity sector in a way that enhances its role in the economy as well as its contribution to greenhouse gas reduction."

Chris Davis from UTS reflected on the findings of the research for Australia's future in water supply saying; "Making urban water systems sustainable for the long haul is challenging and demands complex interventions. Companies like Siemens, which can produce everything from a membrane water purification plant to a washing machine and, crucially, can integrate and control all the components intelligently, are the way of the future."

## Key Findings for Water:

- *PTF* findings show that it has been 15 years since the demand for water in Australia outstripped natural supply. The research found that despite current water management strategies, there is still an urgent need to find technical solutions to meet the ever increasing demand for water. According to Siemens, the water challenge can be solved by:
  - a. **Securing urban water** using technology advancements in areas such as low energy and low environmental impact saltwater desalination, storm water harvesting, advanced wastewater treatment and reuse, and the management of surface and groundwater sources.
  - b. **Improvement in rural water management practices** including monitoring, metering and irrigation processes which are sustainable and increase productivity from Australian inland water ways.
  - c. **Integrated water management** through the development of Smart Water grids which combine a diverse supply of water with a diverse supply of energy sources, to supply the highest quality water in the most sustainable way.
  - d. **Specific technology applications:**
    - i. The development of Continuous Electro-deionisation technologies to reduce the power requirements of saltwater desalination by 65%. The use of membrane pre-treatment technologies for salt water desalination to reduce the environmental impact of plants by over 10% by eliminating returned coagulated solids.
    - ii. Councils will be able to use their large sewage treatment plants to extract Nitrogen and Phosphorous as well as producing up to 1,400 GL/a water for re-use whilst reducing biological solids produced by 70%. Biogas produced from digestion would power up to 40% of the plants processes.
    - iii. All major urban areas can develop a network of ground water, surface water, desalination plants, waste water re-use systems and storm water catchments managed in real-time to meet the requirements of all users. Supply/demand cost matrixes would be developed and adjusted in real time across Australia.
    - iv. Through smart metering technology the Murray Darling Basin will be able to communicate real-time water needs via a network of remote sensors and provide greatest beneficial use of water whilst allocating up to 2,000GL/a of metered water to environmental flows. Excess water not used can then be traded for maximum

return. River flows could potentially be re-supplied through carbon nano-tube humidity farms.

## **Key Findings for Energy:**

- The key issue for Australia in coming decades is the achievement of greenhouse gas emission reduction targets.
- The 2020 target of a reduction of 5% below the 2000 green house gas emission level actually equates to a 47% reduction below the level of emissions that will occur by 2020 if no action is taken to mitigate emissions - this presents a significant technical and financial challenge.
- In order to achieve the 2020 target of 5% below 2000 greenhouse gas emissions, Siemens recommends that Australia needs to invest AUD\$60 billion over the next 10 years in renewable and low CO2 generation technologies while simultaneously undertaking aggressive energy efficiency measures.
- Siemens' *PTF* technology blueprint for energy includes:
  - Efficient and low emission power generation
  - Renewables (solar, wind, geothermal)
  - Advanced transmission and distribution including smart grid technologies
  - Electrified transportation
  - Efficient energy use
- According to Siemens' *PTF*, many of the technologies required are already available. For example, a solar power station sized at 30 x 30 km in central Australia would meet the national electricity demand during daylight hours. Use of such technology would allow Australia to become an exporter of clean electricity.
- By 2030 around 20 percent of vehicles will be electric or hydrogen-based, fuelled by electricity generated from renewable sources.
- Carbon capture technology will be proven by 2020. The construction of new high efficiency coal and gas fired power plants, combined with carbon capture and storage technologies will provide a strong future for fossil power generation.

Goller concluded: "Australia has always had the choice to pursue an economically and environmentally sustainable future – and, even in the midst of global and local challenges caused by the megatrends of climate change, demographic change, urbanisation and globalisation, the findings of our *PTF* research demonstrates that these choices are still available for us to fulfil immediately."

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For further information including photography and B-roll or to book an interview with Siemens please contact Katie Keenan at Text 100 on 02 9956 5733 or email [katie.keenan@text100.com.au](mailto:katie.keenan@text100.com.au).

## **Available for interview on 22<sup>nd</sup> March 2010:**

- Albert Goller, CEO Siemens Australia
- Chris Davis, Sustainability Business Development Manager at the University of Technology Sydney
- Paul Graham, Theme Leader, Energy Futures, for the Energy Transformed National Research Flagship at CSIRO

## **About Siemens in Australia and New Zealand**

Siemens commenced operations in Australia in 1872 and in New Zealand in 1876. Siemens is now recognised as one of the most reliable and trusted brands in the region. With well-established businesses in both Australia and New Zealand, Siemens is a diversified technology-based solutions provider specialising in the areas of water, energy, environment, healthcare, productivity, mobility, safety and security. At the end of fiscal 2008 (September 2008), Siemens achieved AUD 1.875 billion in sales with 3,336 employees. Siemens in Australia and New Zealand is part of the Siemens global network of innovation which operates in 190 countries throughout the world.

## **About Siemens Picture the Future Project**

Siemens Picture the Future Outlook Series (PTF) is a research project focusing on the future of Australia and New Zealand in 2020, 2030 and beyond. Managed by specialist research teams comprised of local and global experts, PTF primarily addresses Australia's water and energy landscapes in the future. Collaborating with some of Australia's leading research and development institutions, the PTF project delves into challenges we face as a nation and the likely solutions for future water availability and energy sustainability from a technology perspective. Subsequent studies in this series will cover other crucial areas such as the environment, healthcare, productivity, mobility, safety and security for both Australia and New Zealand.

## **About World Water Day**

International World Water Day is held annually on 22 March as a means of focusing attention on the importance of freshwater and advocating for the sustainable management of freshwater resources. The international observance of World Water Day is an initiative that grew out of the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro.

## **Appendix: Quick Facts from Siemens *Picture the Future***

### ***Energy***

- Australia has the highest CO2 emissions per capita in OECD
- Coal and gas to provide the majority of Australia's energy until 2030
- Australia's ageing fleet of coal and gas fired power plants generate around 93 percent of electricity contributing significantly to green-house gas emissions
- Globally, 900 billion kilowatt hours of electricity would be saved if all incandescent light bulbs were replaced by energy efficient lamps (equivalent to half of China's electricity demand, and four years of Australia's electricity demand)
- In Australia, 300,000 industrial motors consume 65 percent of industrial energy
- Energy optimisation could result in a reduction of 5 million tonnes of CO2 annually
- Large scale CCS is forecast to be viable by 2020; by 2030 half of all coal and gas plants will need to operate with CCS
- Australia is energy wealthy with extensive solar, wind and geothermal renewable energy sources
- Renewables will supply more than 40% of Australia's electricity by 2030
- The energy mix of the future will include solar, wind, geothermal, gas fired and clean coal solutions There will be a shift to a mix of renewable and low CO2 technologies over the next 30 years.

## **Water**

- Evaporation and transpiration are a major cause of water shortage with over 90% of water lost through evapotranspiration – every 1% increase in temperature causes a 5% loss through evaporation
- Water demand is continually rising due to population growth and the requirements for water and water embedded products
- Urban water demand is expected to increase by more than 30% due to population growth and urbanisation by 2030
- Urban water prices could increase by 2-3 times current cost by 2030
- Yearly total water consumption including Urban and Agricultural water (65% of current water use) is expected to remain around 15,000GL, (15,000 billion litres).
- With new technologies such as Continuous Electro-deionisation, salt water desalination can be an environmentally-friendly water option by:
  - Reducing energy consumption per ML by 65 percent
  - Environmental footprint reduced by up to 80 percent
- The Murray Darling Basin – Climate change has resulted in significantly reduced flows (21,000GL to 7,000GL), high salinity levels and lack of run off to storage and river flows (principally due to extremely dry soils)
- Thousands of smart water monitoring sensors can be deployed in pastures and fields, which report moisture and nutrient requirements of soil and crops, to maximise the minimum volume of water required for each individual crop planting.
- Real-time water trading will allow automated systems to use or trade water for maximum value
- The integration of all water supply sources with a smart energy grid will provide the lowest cost, lowest environmental impact solution for Australia

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