Global decline in world electricity demand – efficient smart cities need less energy.

**Prof Ray Wills** 

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Chief Adviser Sustainable Energy Association of Australia

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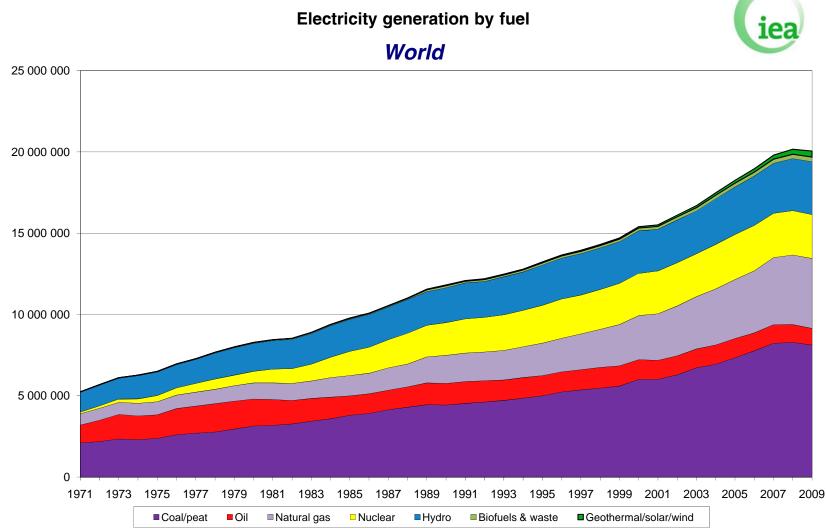




# Global electricity ...

**IEA Energy Statistics** 

Statistics on the Web: http://www.iea.org/stats/index.asp

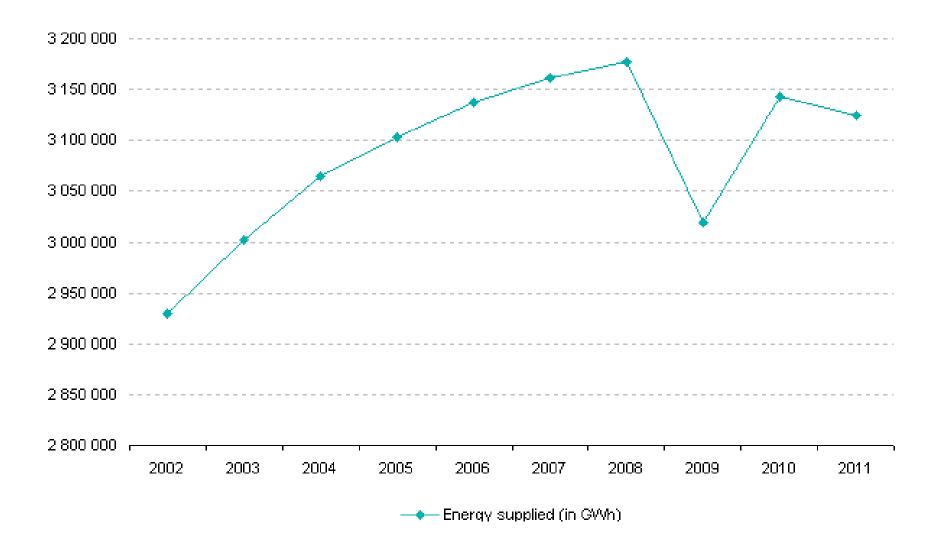


© OECD/IEA 2011

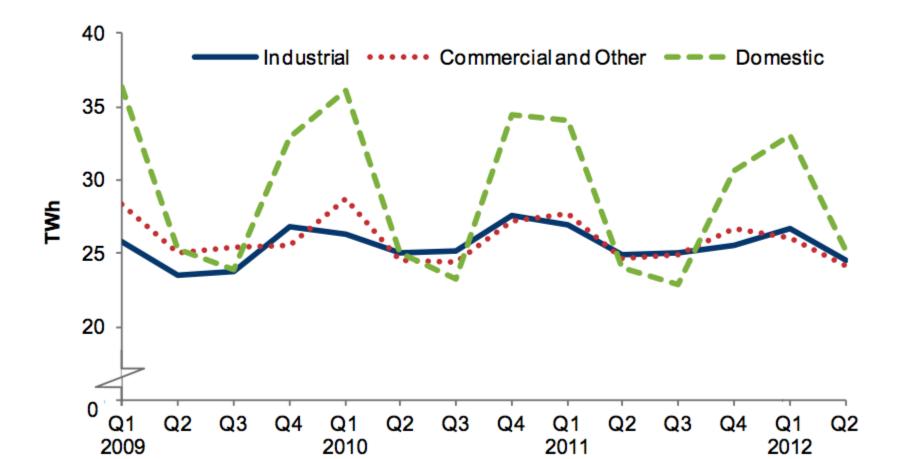
GWh

For more detailed data, please consult our on-line data service at http://data.iea.org.

# Global electricity growth - Europe

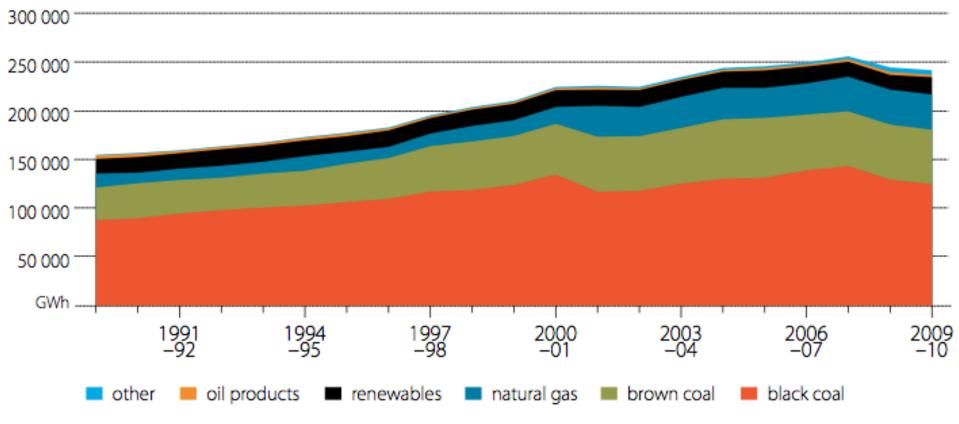


# Global electricity growth - UK Chart 5.4 Electricity Final Consumption



# Australian electricity ...

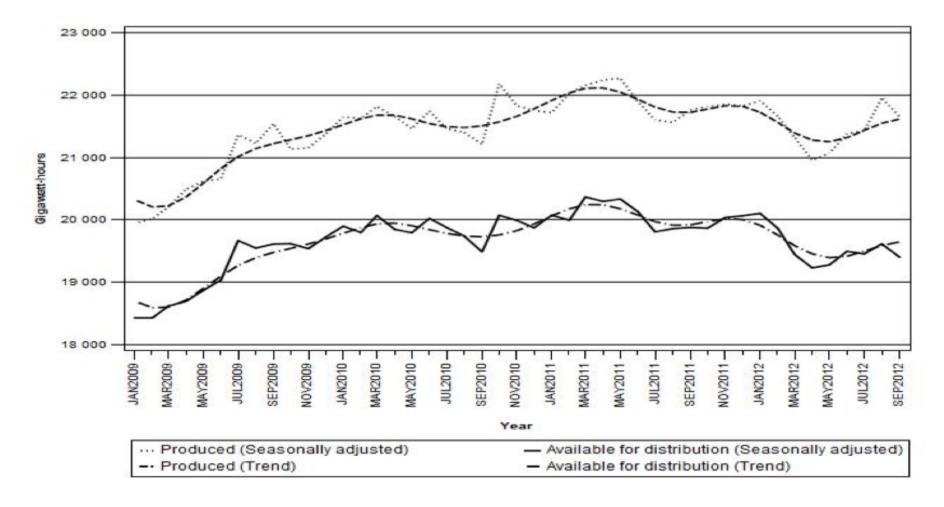
#### Australian electricity production, by fuel



Data ABARES

# South Africa electricity 2012...

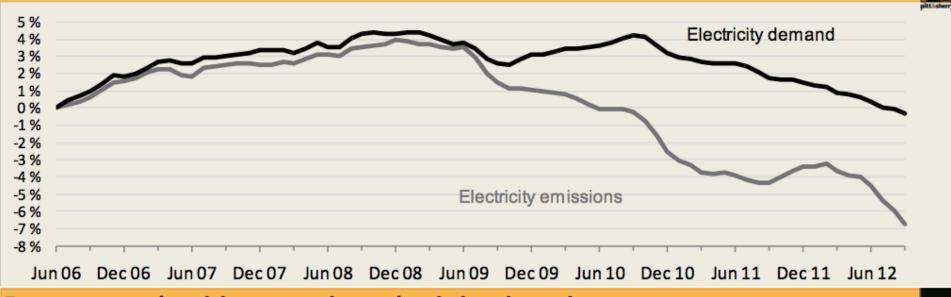
#### Figure 1 – Electricity produced and available for distribution in South Africa, seasonally adjusted and trend



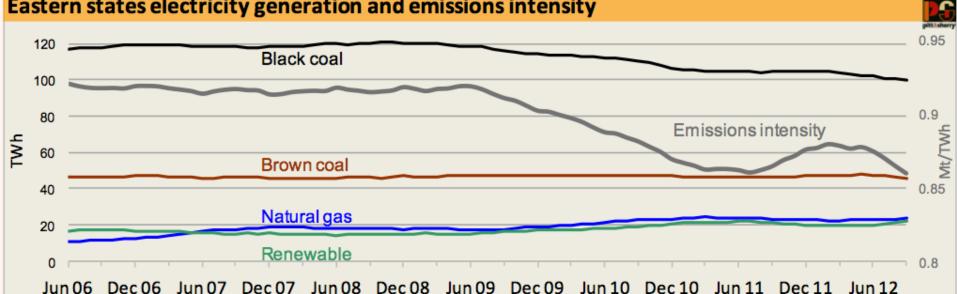
PJ Lehohla Statistician-General, Statistics SA Sep 2012

# Australian electricity consumption 2012...

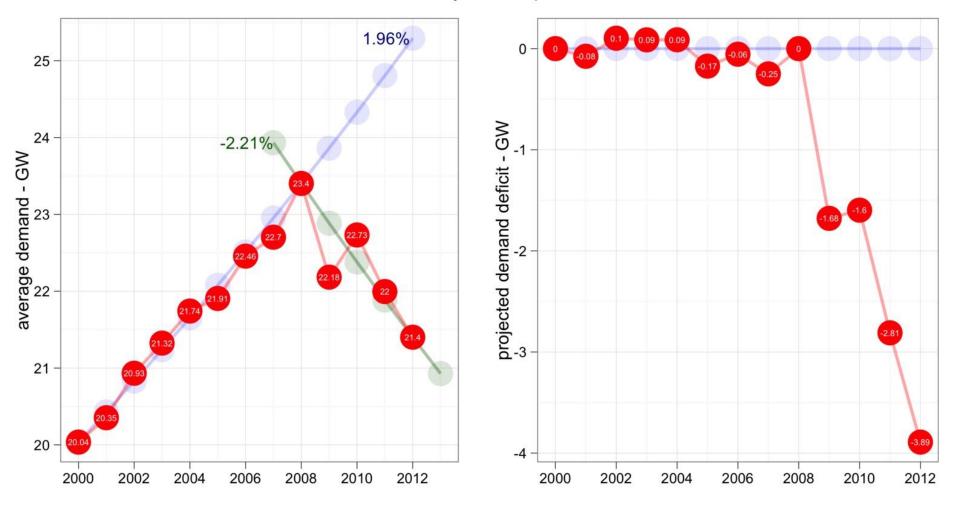
Changes in electricity generation and emissions



Eastern states electricity generation and emissions intensity



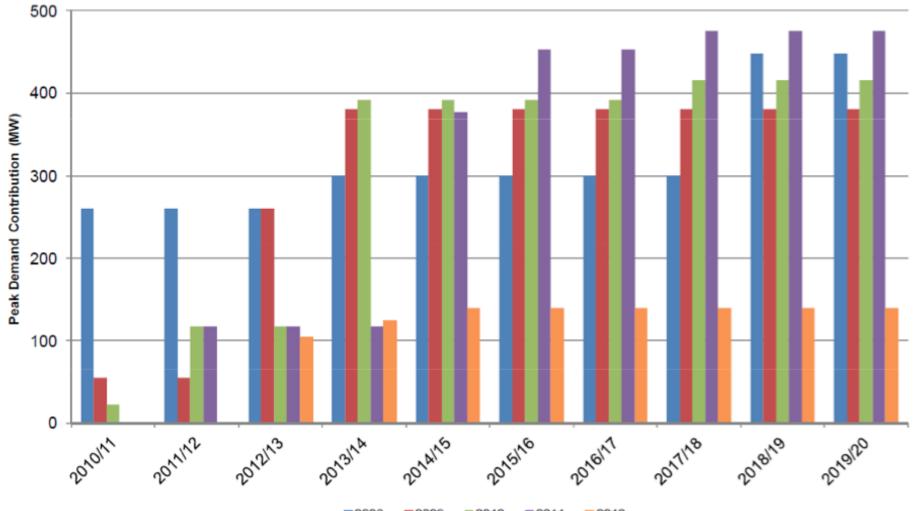
# Australian electricity demand 2012...



NEM : 1-July to 30-September

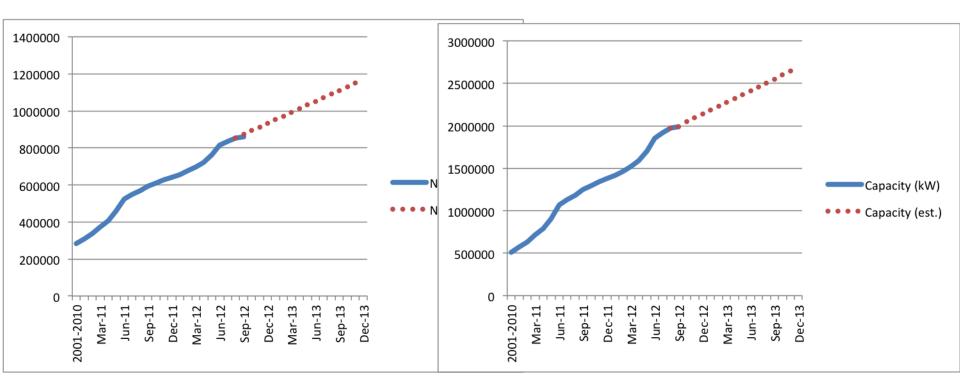
Data AEMO

# Electricity market projections – WA



■2008 ■2009 ■2010 ■2011 ■2012

# Solar on Australian homes

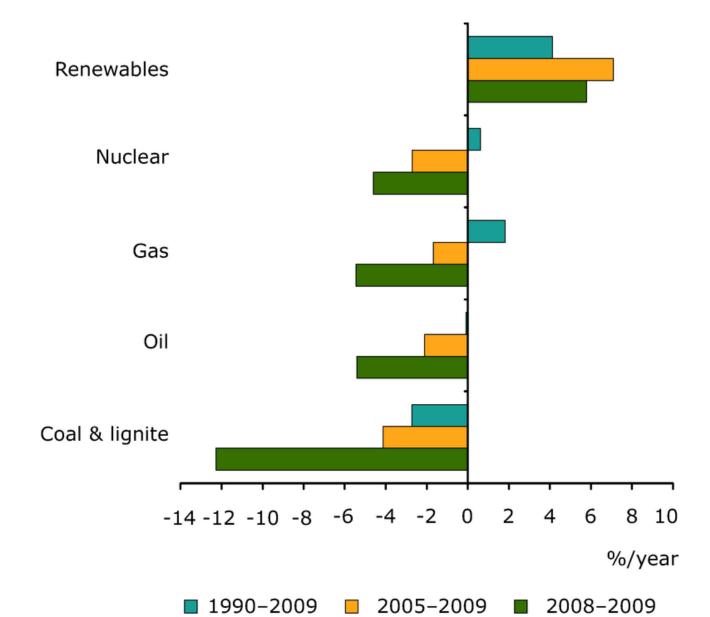


# Technology energy use

#### Annual Electricity Energy Consumption (in kWh)



# Global electricity growth



# Rapid change - - - - - - Personal mobility





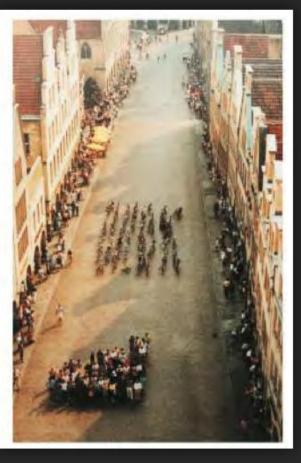
## Private transport

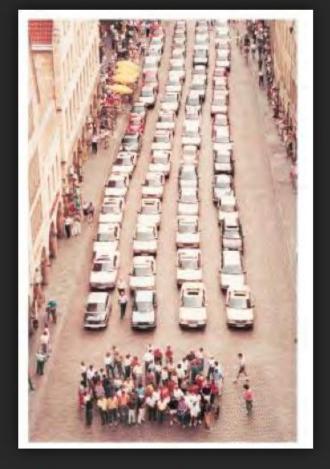
- Fuel efficiency, other energy sources
- Transport
- Energy storage key
- New technologies may be disruptive





#### City of Münster, Planning Department Comparison of amount of space required to transport 72 people







72 bicycles = 90sqm Based on 1 person per bike 60 cars = 1000sqm Based on 1.2 people per car 1 bus = 30sqm Based on 72 people per bus

# Commercial vehicles

Smith Newton electric truck Mega electric diesel hybrids •London Bus •Haul Pak + Earthmover •Mitsubishi Fuso •Honda prime mover

















# Flying and floating fuels

- February 25, 2008 –
  Virgin Atlantic Stages the First Biofuel Flight
- October 30, 2007 U.S.A.F. Tests New Synthetic Fuel on Plane
- February 14, 2011 Qantas follows US Military to algae biofuels
- September 13, 2011 US Navy announces by 2016 Green Strike Group, powered by renewable diesel-electric engines, nuclear power and aviation biofuels, is able to operate independent of fossil fuel supply line threat or disruption





# Smart grids, smart houses (and farms)

- Integrated energy planning
- Smart grids to coordinate the actions of devices such as loads & generators



# Green cities

## Global

- Tianjin Eco-City China
- Ulsan Ecocity Korea
- Masdar City UAE

## Australia

- City of Sydney 70% CO2 reduction by 2030
- City of Melbourne
- Stirling City Centre, Perth
- City of Cockburn
- City of Fremantle
- Yanchep 2 x 100 000
- Local government critical









#### www.seaaus.com.au

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Probono legal advice provided by Jackson McDonald Lawyers

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