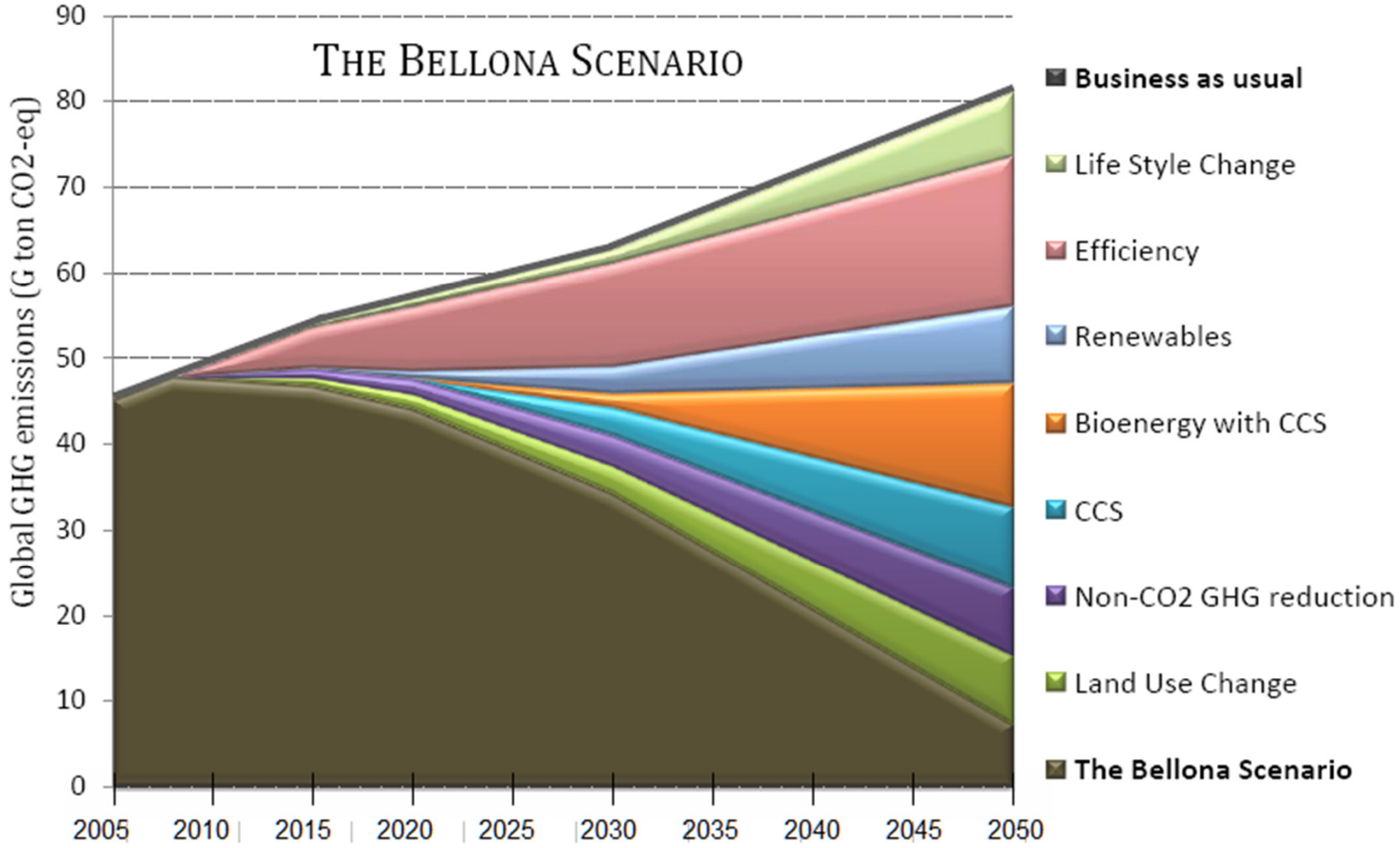
How to combat global warming:

The Bellona Scenario



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Nuclear industry

- **Total global electricity production is 19,756 TWh in 2009**
- **2,719 TWh produced by nuclear power plants, equivalent to 14% of global electricity production.**
- **But … it's only 6% of global energy consumption**

Source: World Energy Outlook , World Nuclear Association

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Electricity generating costs in USA 2011; General assumptions & definitions

- **Main cost assessment components of power production**
  - LOE – Levelized cost of electricity
  - Main cost components
  - Cost of capital
    - *Investment and return on investment over the lifetime of investment*
  - Operation & Manning cost
  - Fuel cost
  - Carbon cost
    - *Cost of carbon emissions at USD 30 per tonne*
  - Storage cost
  - Decommissioning cost
  - Disaster insurance
  - No transmission or distribution costs, i.e. cost at plant gate

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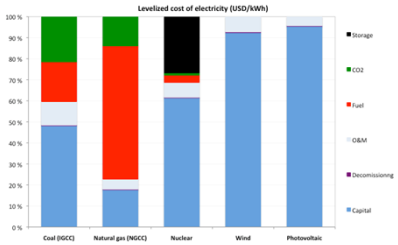
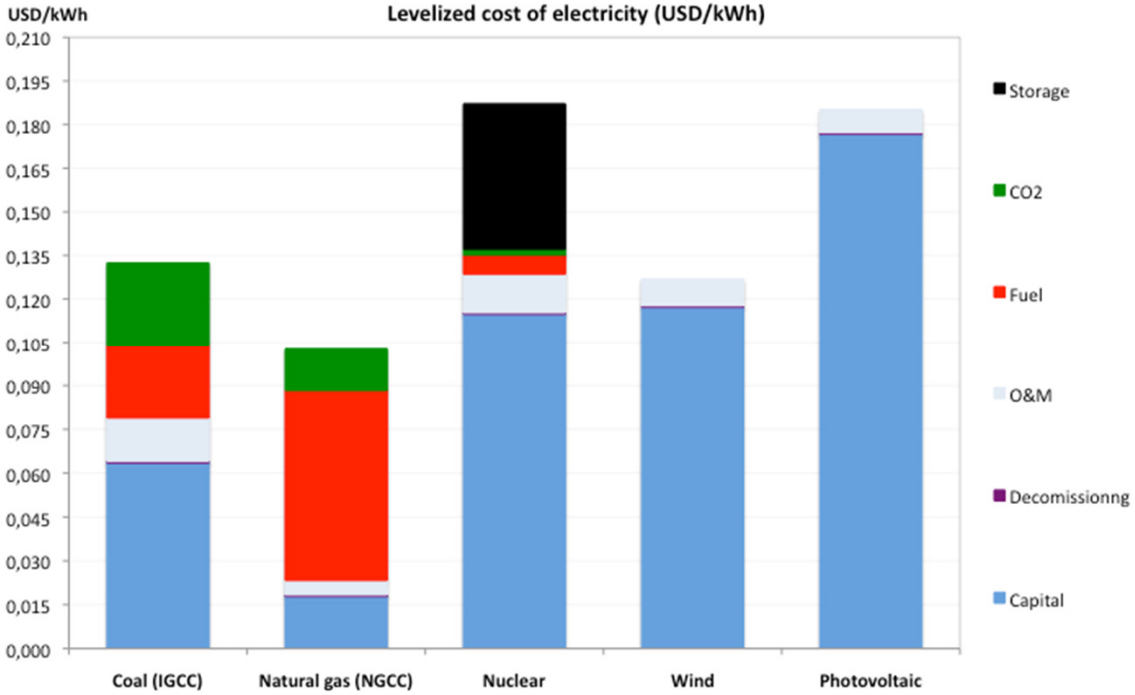
Cost of electricity – 2011 update





Main assumption

- 9% required return on investment
- Coal & N-Gas prices as seen in market
- EIA – US DoE latest capital cost assessment (Nov 2010)
- 30 USD/mt CO^2
- PV at current market prices for large installations
- Current Nuclear storage cost as seen in the US system over the utility bill of consumers (i.e. not charged to the manufacturing cost for producers of nuclear energy)

Primary sources of information

EIA, US Department of Energy November 2010; "Updated capital cost for electricity generation plants"

IEA/NEA, "Projected cost of generating electricity – 2010 edition"

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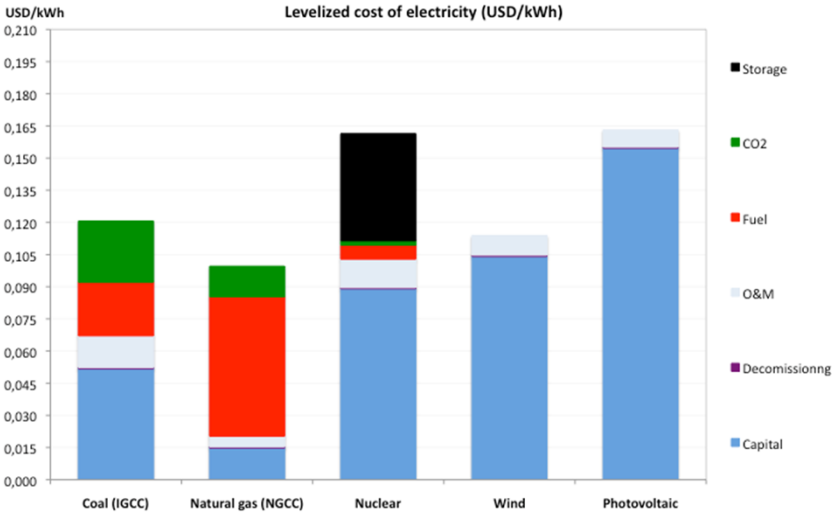
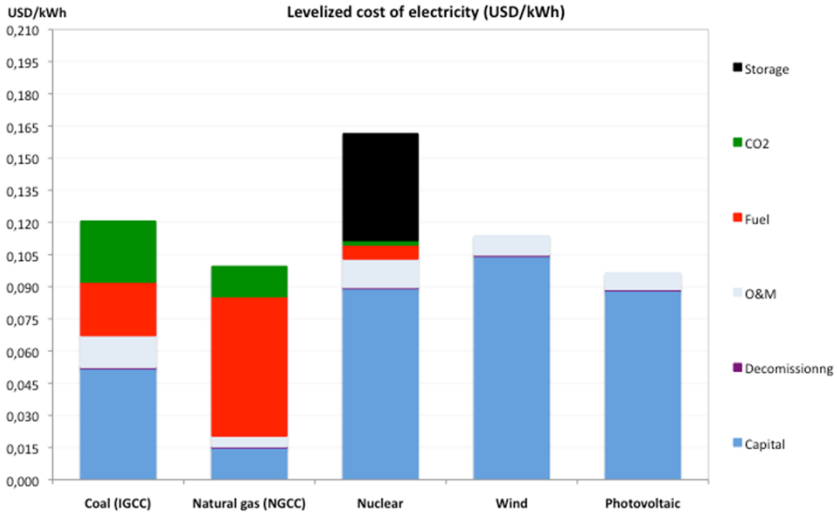
Sensitivity to capital and true cost of PV

"Nuclear energy stands out as the most expensive … and risky source of electricity" ….

7,5% interest



7,5% interest & PV at current manufacturing cost



Primary sources of information

EIA, US Department of Energy November 2010; "Updated capital cost for electricity generation plants"
IEA/NEA, "Projected cost of generating electricity – 2010 edition"

… and the cost will only increase going forward!

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Nuclear Power is to expensive to play an important role in future energy-supply because....

- **Cost is too high**
- **Risk is too high**
- **Resources too scares**
- **Dismantling and storage cost are not properly included in the power producers production costs**

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