



Panel #3

OPTIONS FOR BUILD-OUT OF A SUSTAINABLE BIOENERGY INDUSTRY IN THE GREAT LAKES

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ONTARIO **POWER**
GENERATION

⊙ Context

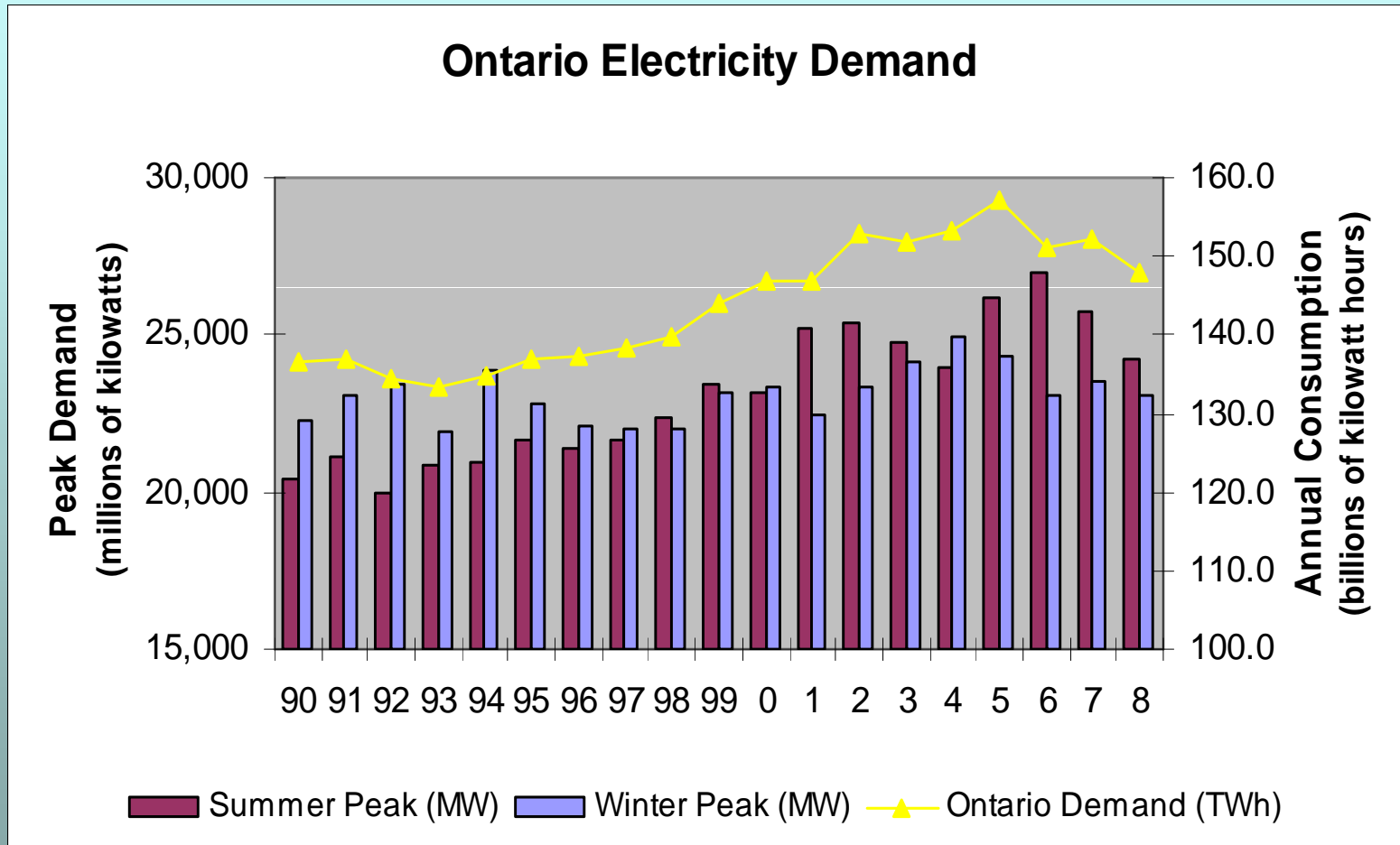
- Electricity consumption
- OPG
- Requirements to reduce CO₂ emissions

⊙ Near Term Options

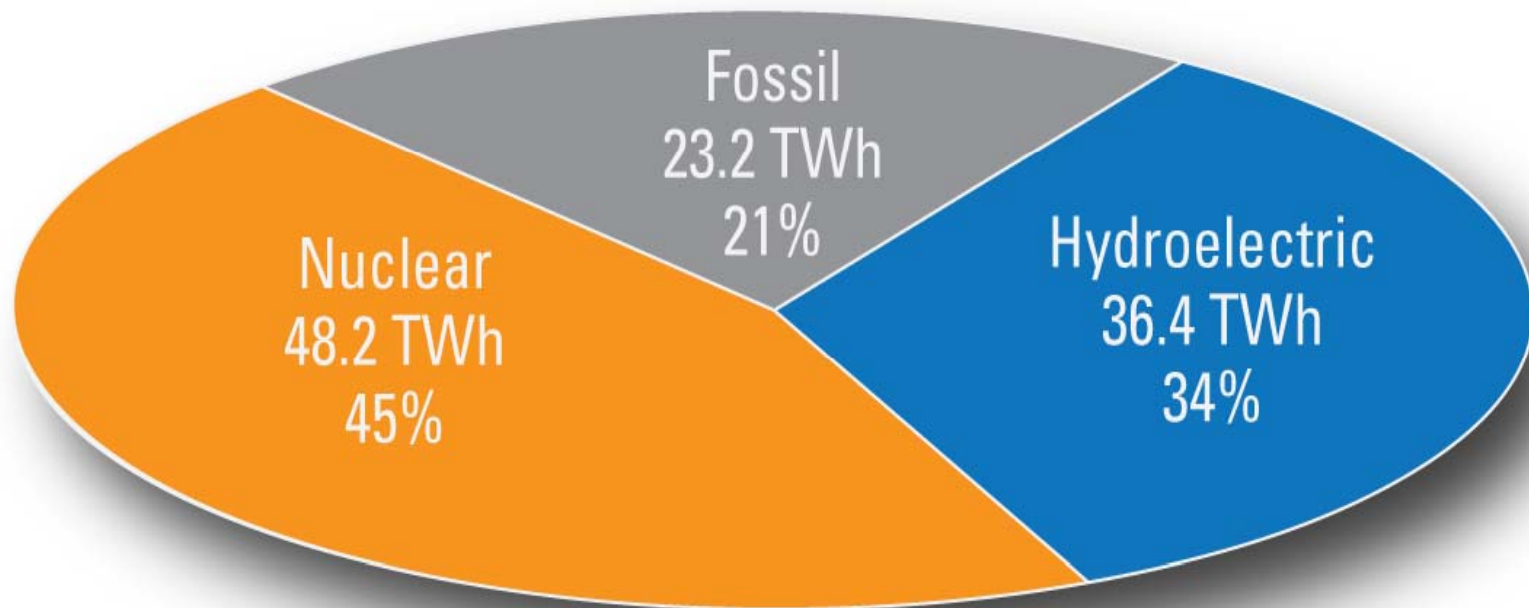
⊙ Factors Influencing Decisions

⊙ Maximizing Contribution of Biomass

Electricity Demand



2008 OPG Energy Production - 107.8 TWh

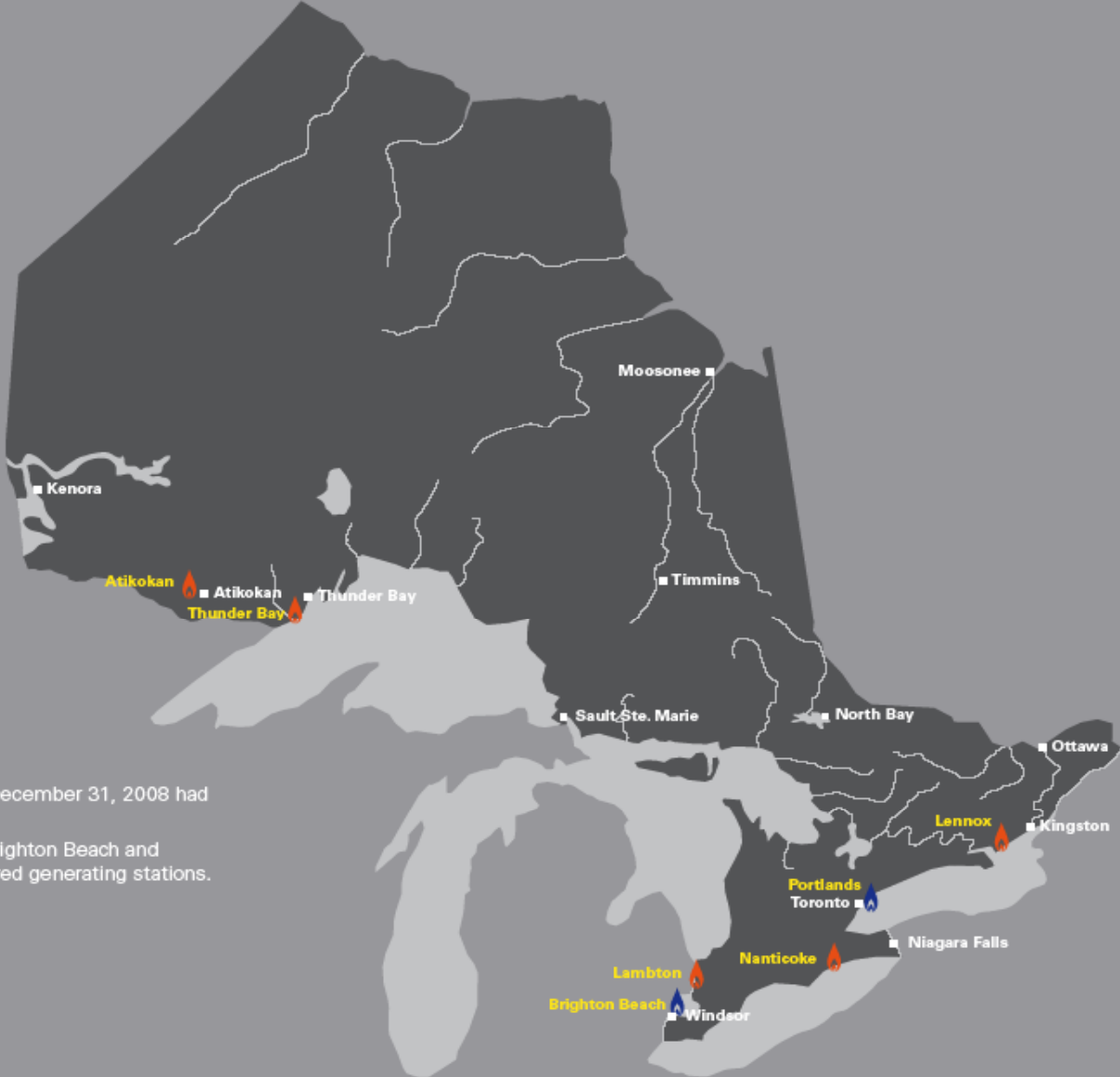


OPG Fossil Generation Facilities

5
Fossil-Fuelled
Stations

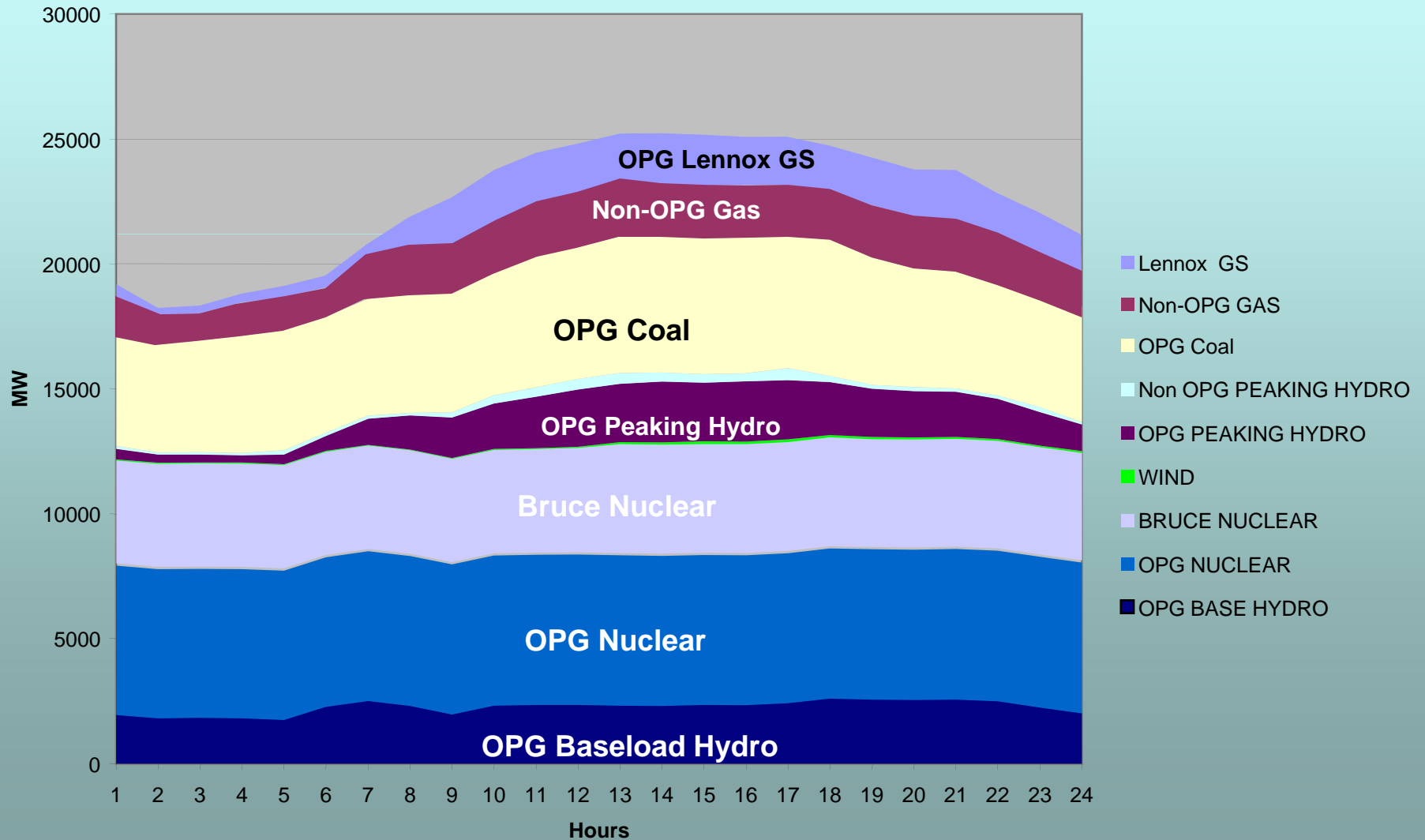


2
Co-owned
Gas-Fired Stations

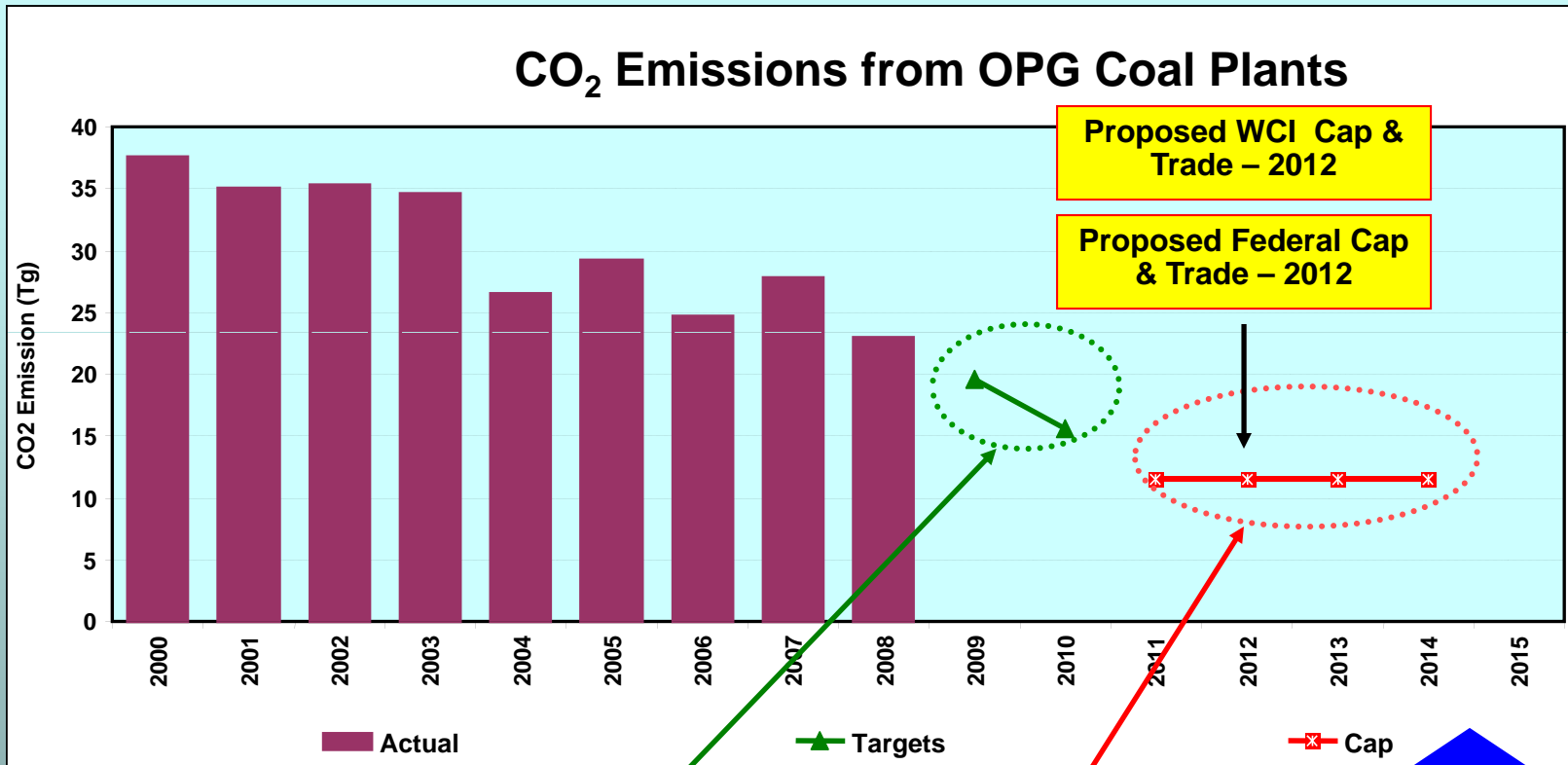


OPG's Fossil generation portfolio as of December 31, 2008 had a total in-service capacity of 8,177 MW.
OPG is also co-owner of the 580 MW Brighton Beach and 550 MW Portlands Energy Centre gas-fired generating stations.

Supplying Ontario Peak-Demand (Aug 1, 2006)



CO₂ Emissions from OPG Coal Plants



Target based on
*Shareholder
Declaration and
Resolution*

Proposed hard cap
based on *Ontario
Regulation O.Reg
496/07 Amendment*

Use of coal
ends under
*Ontario
Regulation
O. Reg 496/07*

Biomass– European Experience

- ⊙ Renewable energy standards
- ⊙ Renewable energy premiums



Les Awirs #4, Belgium
100% wood pellets



Avedore, Denmark – 70%
wood + 30% gas/oil)



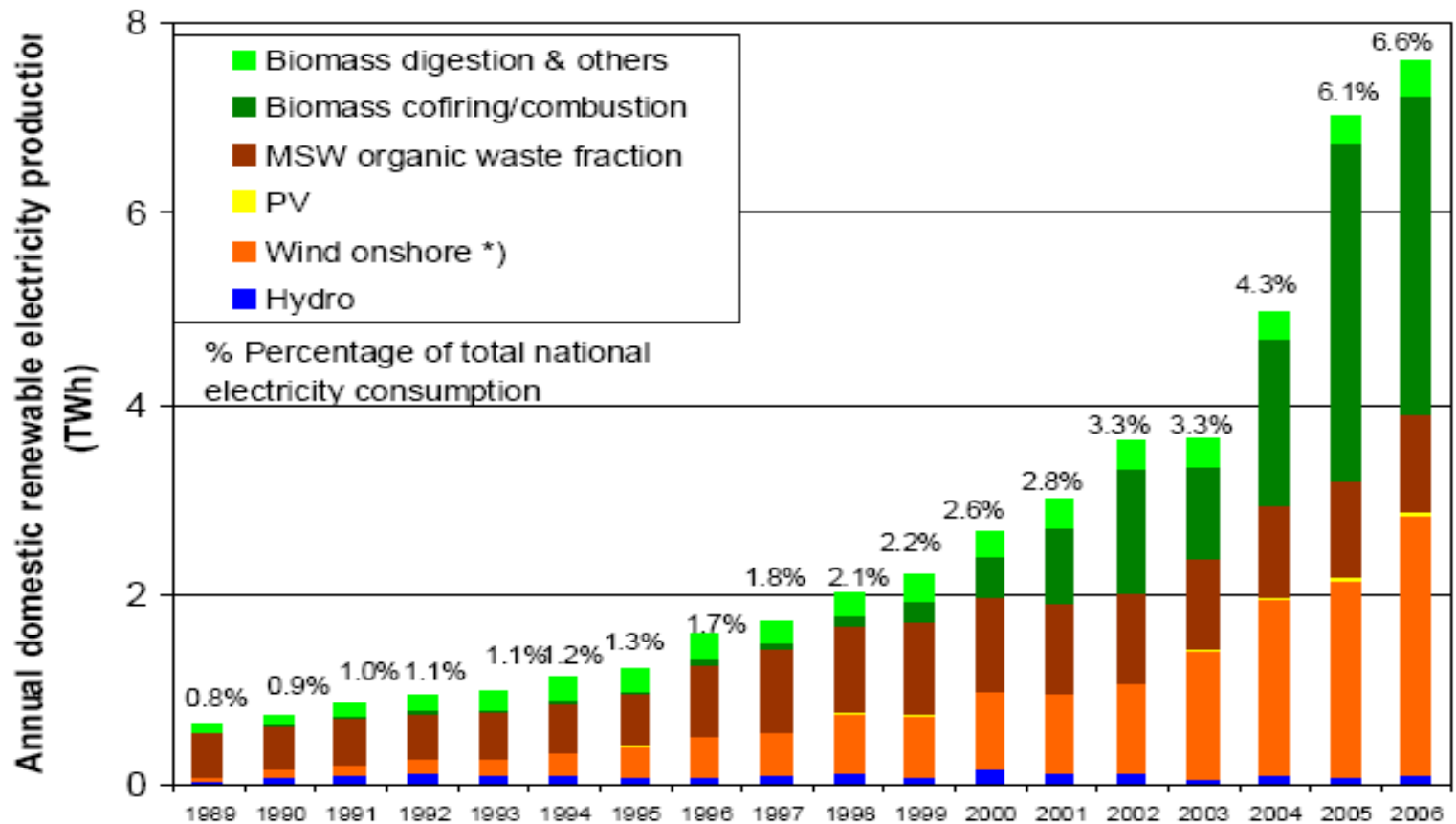
Amer, Netherlands –
20% wood + 80% coal



Fiddlers Ferry, UK – 20% biomass + 80% coal

Renewable Energy Initiative: Biomass The Dutch Experience

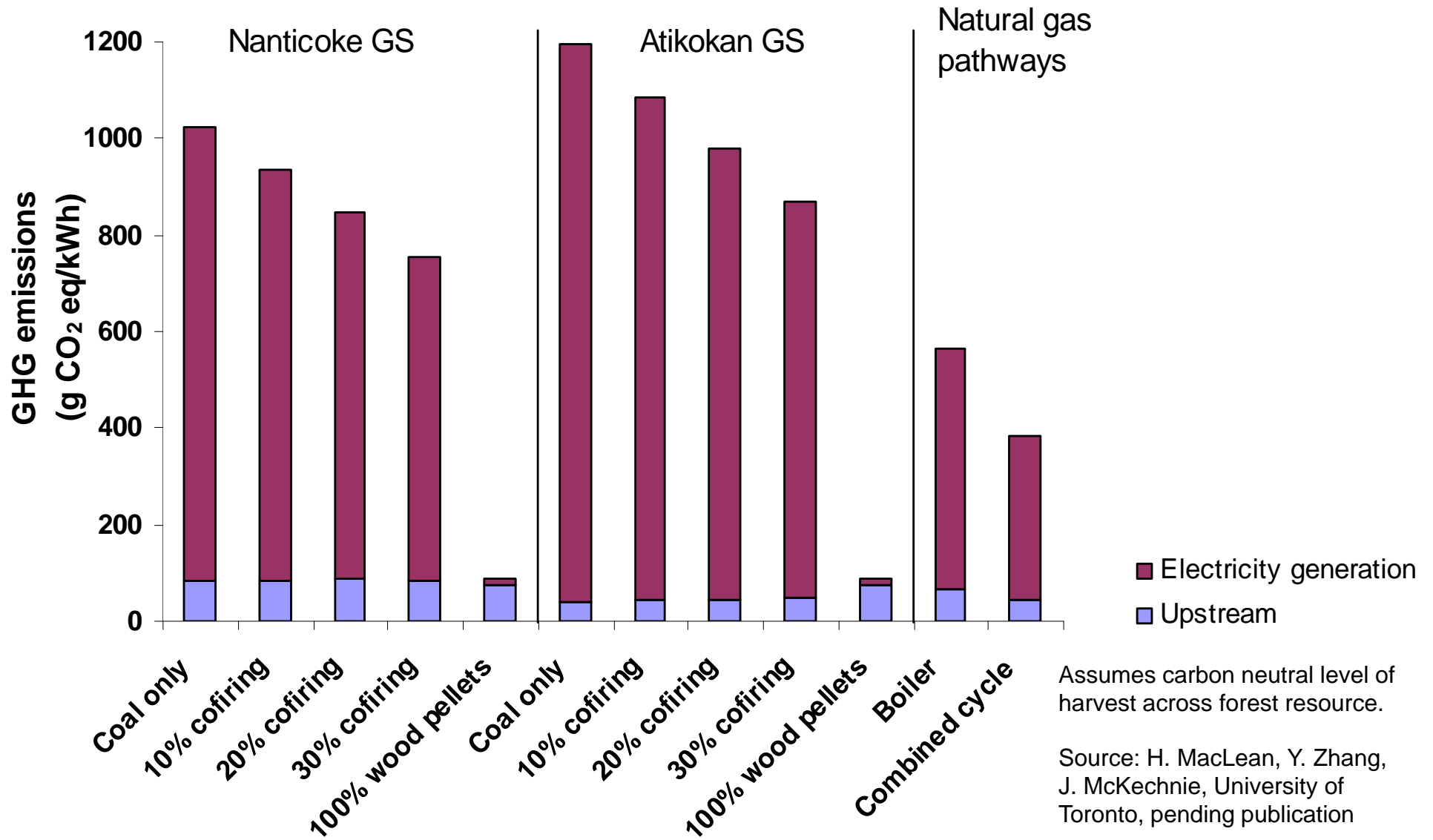
Annual renewable electricity production in the Netherlands and contributions per technology- 1989 until 2006.



*) Wind offshore 2006: unknown

Source: IEA Bioenergy Task 40 – Country Report for the Netherlands Update 2007. R. Sikkema, M. Junginger, A. Faaij, Universiteit Utrecht Copernicus Institute

Life cycle net GHG emissions: Reference and pellet pathways



Near Term Options

- ⊙ Biomass co-firing
- ⊙ Fuel switching/Conversion of units to biomass

Factors Influencing Decisions

- ⊙ Regulation to reduce CO₂ emissions
 - existing regulation to cease coal use at the end of 2014.
 - anticipated cap & trade – 2012
- ⊙ Existing electricity infrastructure & market
 - Makes use of existing assets – lower capital costs
 - Dispatchable renewable energy
- ⊙ Synergy with forestry sector
- ⊙ Net GHG reduction
- ⊙ Public acceptance & perception
- ⊙ Costs

Maximizing Contribution of Biomass

- ① Value along the entire fuel supply chain
 - Fuel contracts consistent in scope and scale with the electricity industry
- ① Investment in transportation infrastructure to fully exploit the benefits the Great Lakes provide
- ① Regional recognition of sustainable practices.
- ① Emerging technologies
 - torrefaction