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Cofiring wood pellets in Europe

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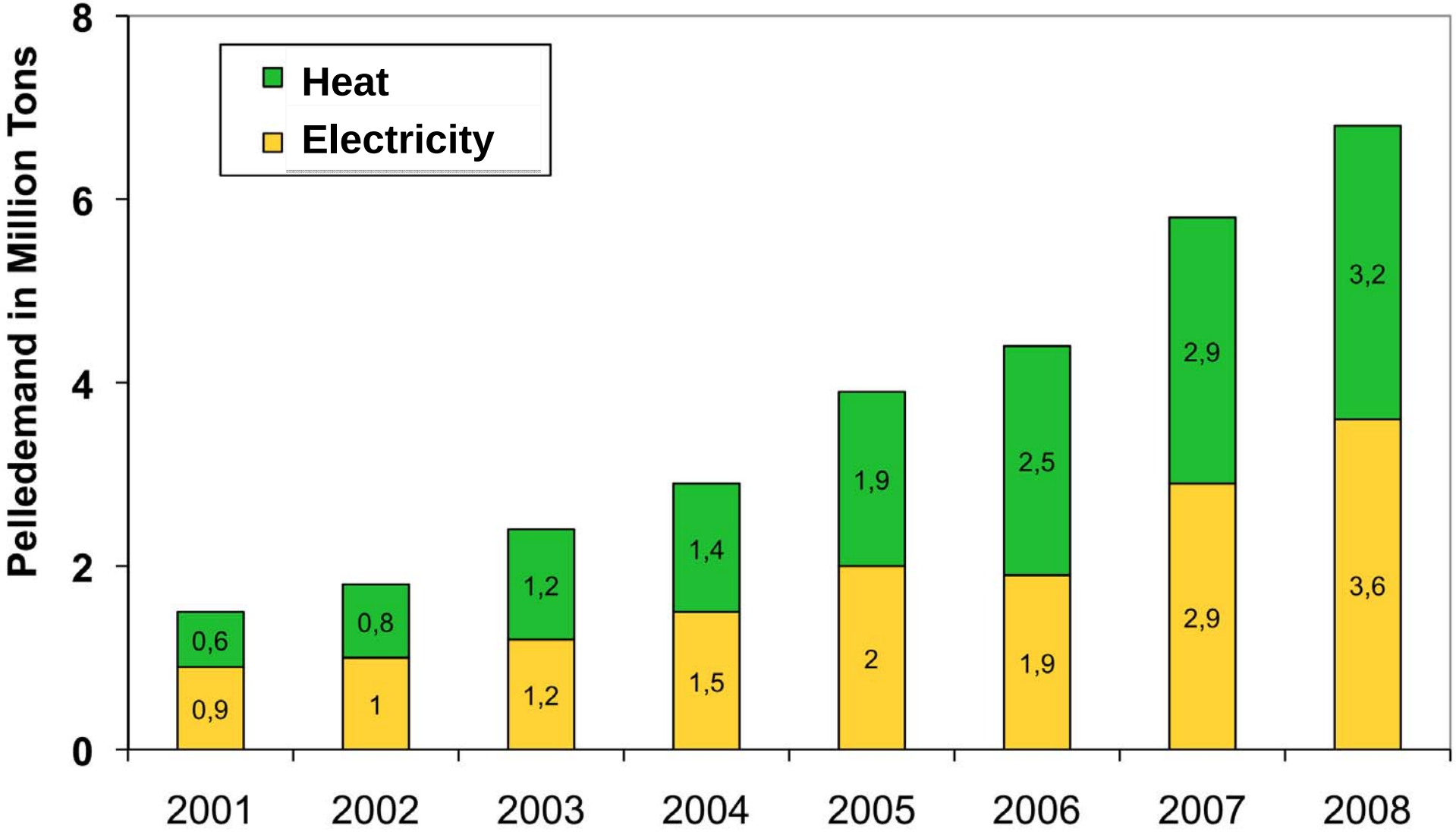
Pellet Demand in Europe



Quellen: pellet@tlas, Bioenergy International

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Cofiring created the first significant market for pellets in Europe!

- Hässelby power plan in Stockholm was the first coal plant to convert to pellets
- 300 MWth CHP plant
- Pellets made to ship sawmill residues from the north

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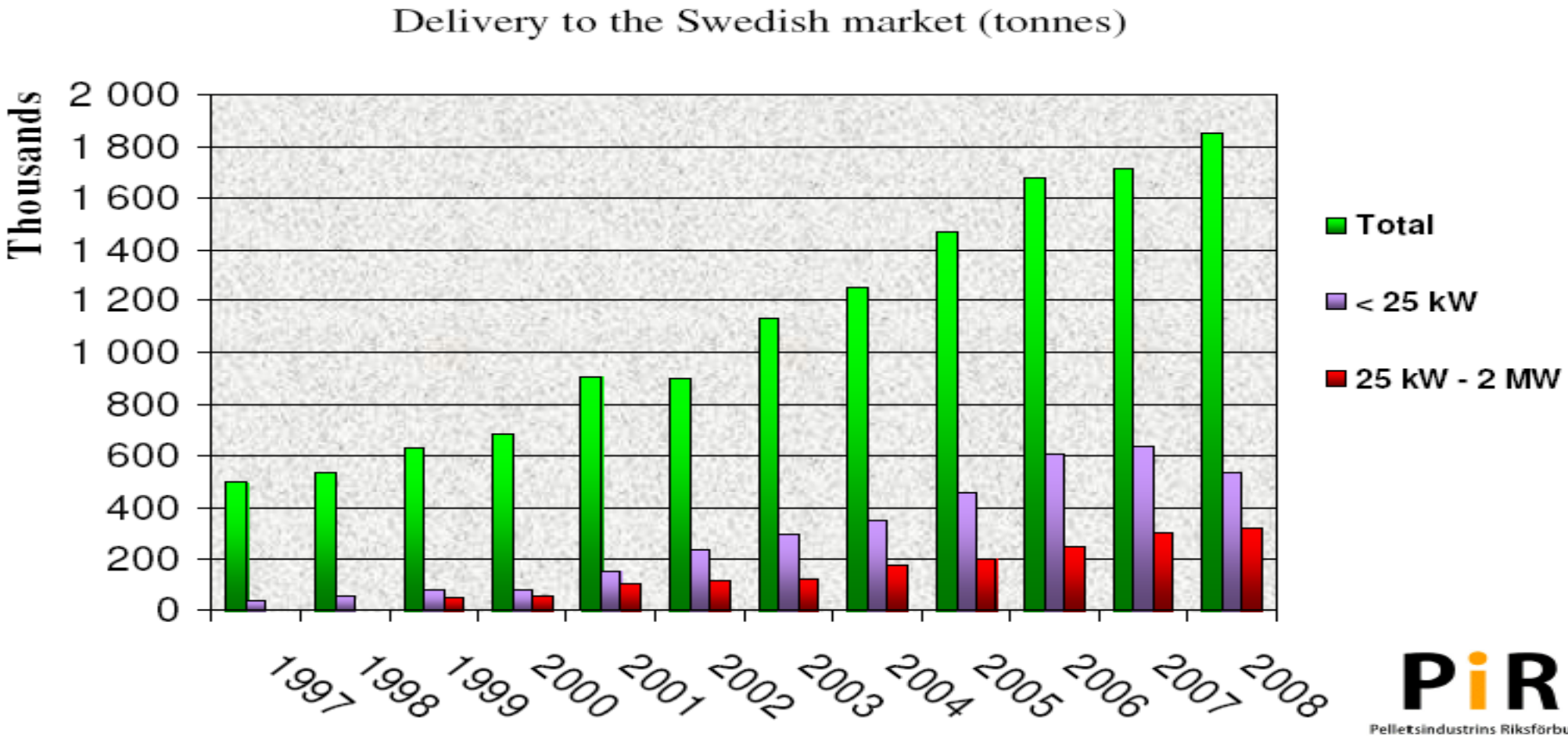
Swedish pellets production 1997-2008



PiR
Pelletsindustrins Riksförbund

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The next countries to use pellets for cofiring were Belgium & Netherlands

- Both countries have few indigenous wood ressources & political committements for increased RES use
- Need for import evident
- Low capital requirement for conversion
- Utilities: Electrabel / SUEZ in Belgium, Essent / RWE in Netherlands

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Why cofiring is attractive: low cost renewable energy

Source: Verkenning Schoon & Zuinig, 2009

Cost including base tariff [€ct/kWh]	2012	2015	2020
Waste to Energy (WtE) *	5.9	6.3	7.7
Wind onshore	8.7	8.7	8.7
Biomass co-firing	**8.1**	**8.9**	**10.3**
Wind offshore	15.9	14.2	11.3
Small-scale biomass **	13.4	14.1	15.4
Hydropower	19.1	20.3	22.4
Solar-PV	47.3	40.2	26.0
Base tariff	6.6	7.0	8.4

* Cost for WtE only known for 2008 [ECN 2008].

** This is the average of several biomass option [from Verkenning S&Z, 2009]

Source: Essent Biomass Conference 2009

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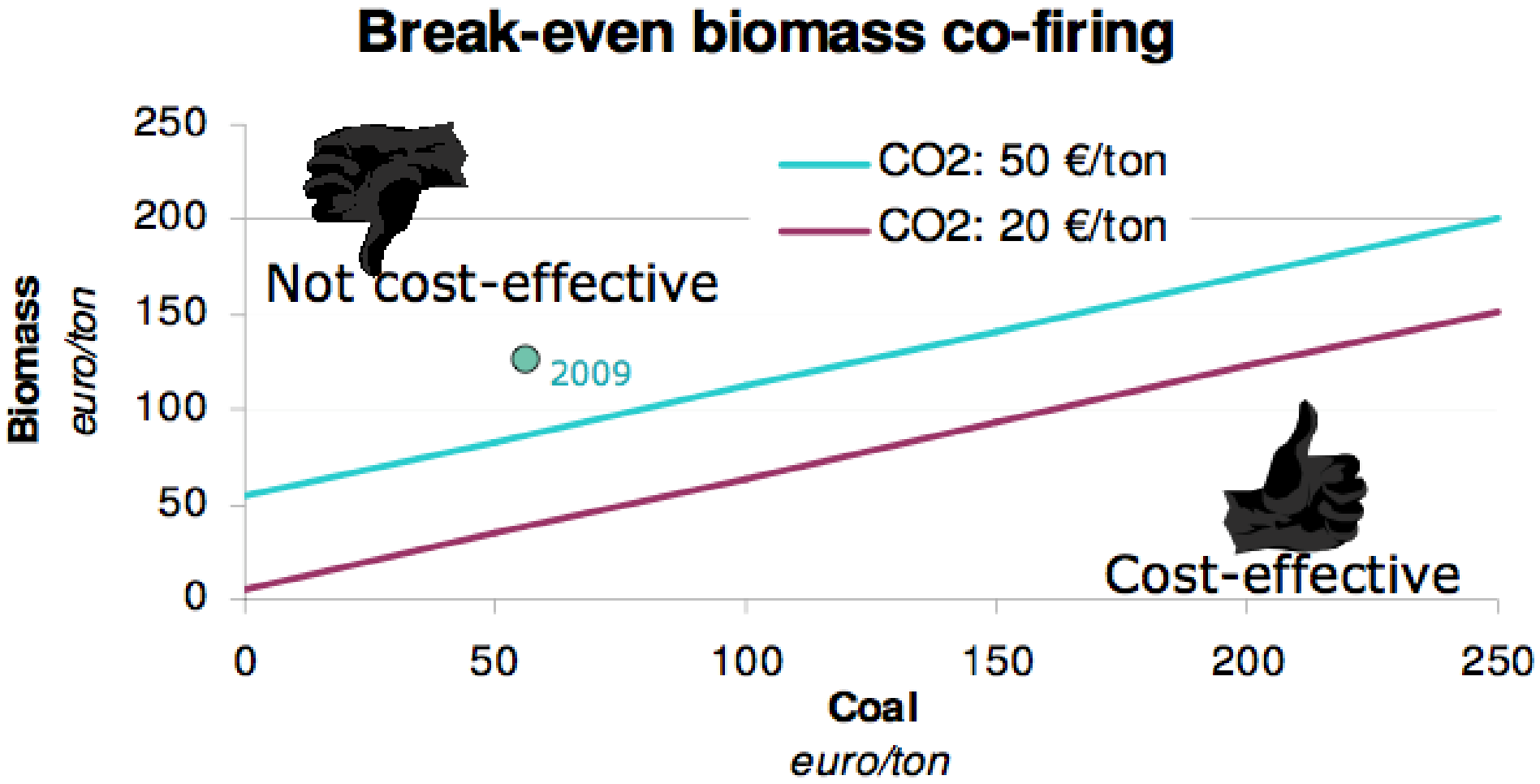
The influence of coal and CO2 costs of pellet competitivity



Source: Essent, Essent Biomass Conference 2009

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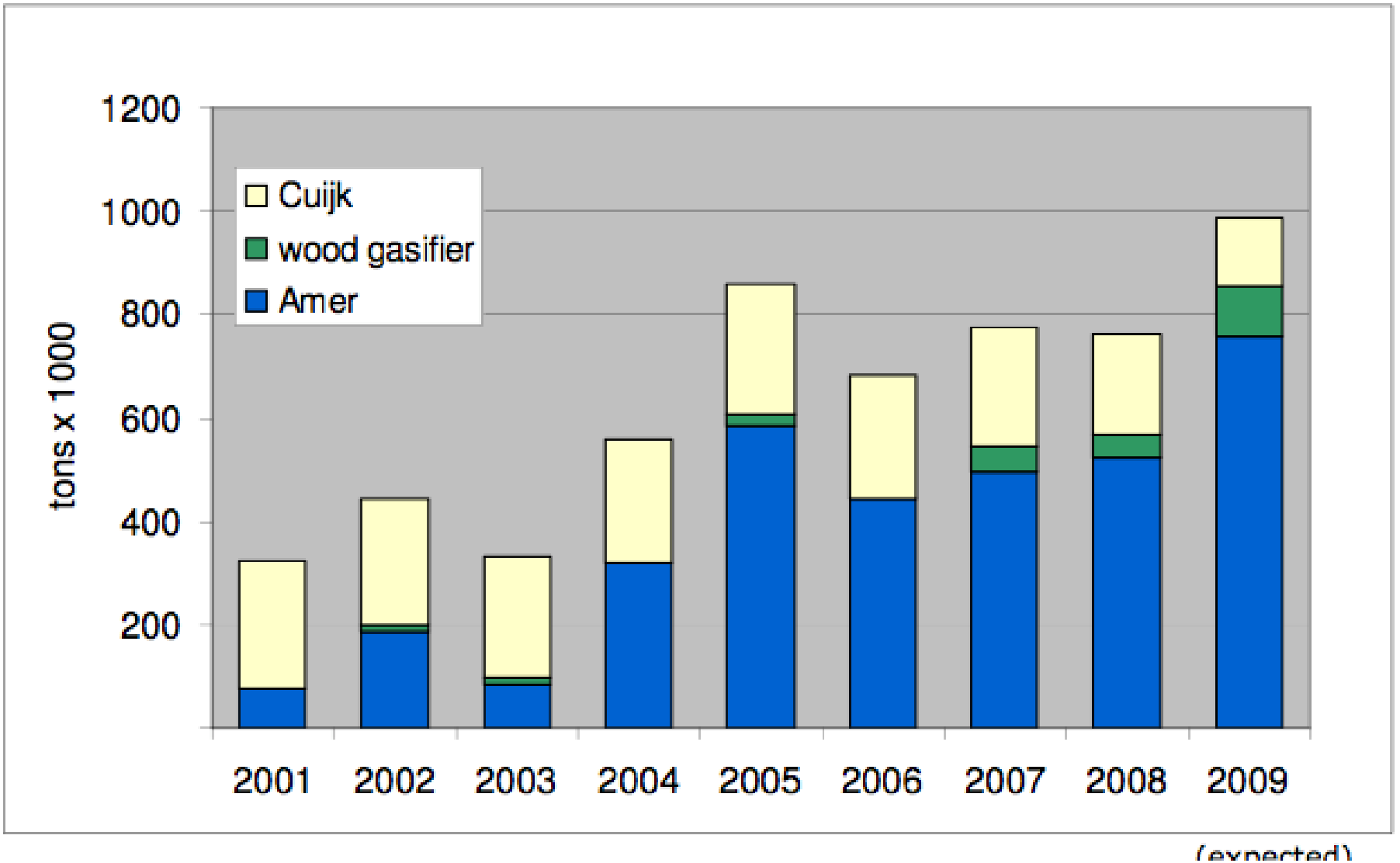
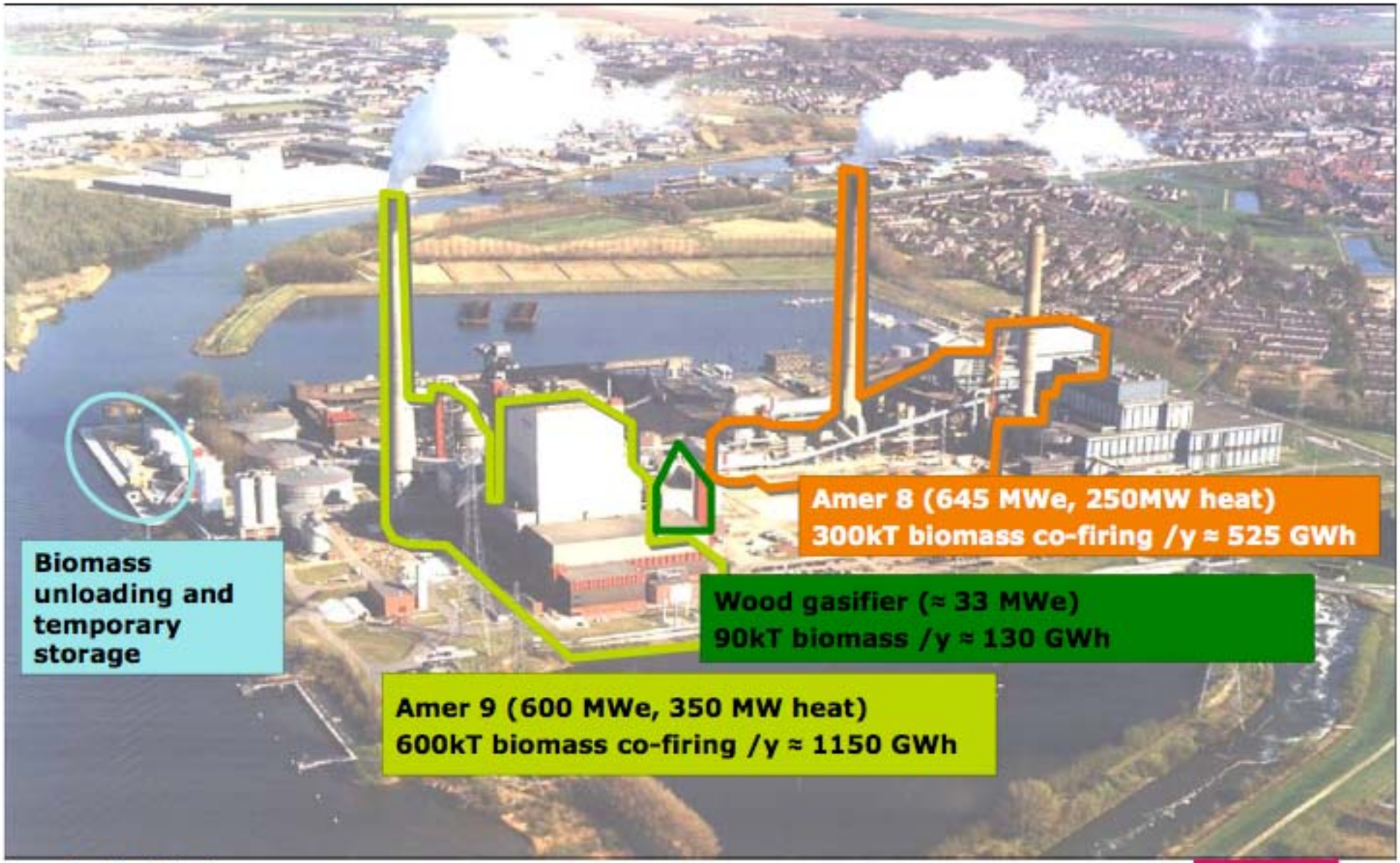
Cofiring in the Netherlands



Amer: the largest European co-firing power plant



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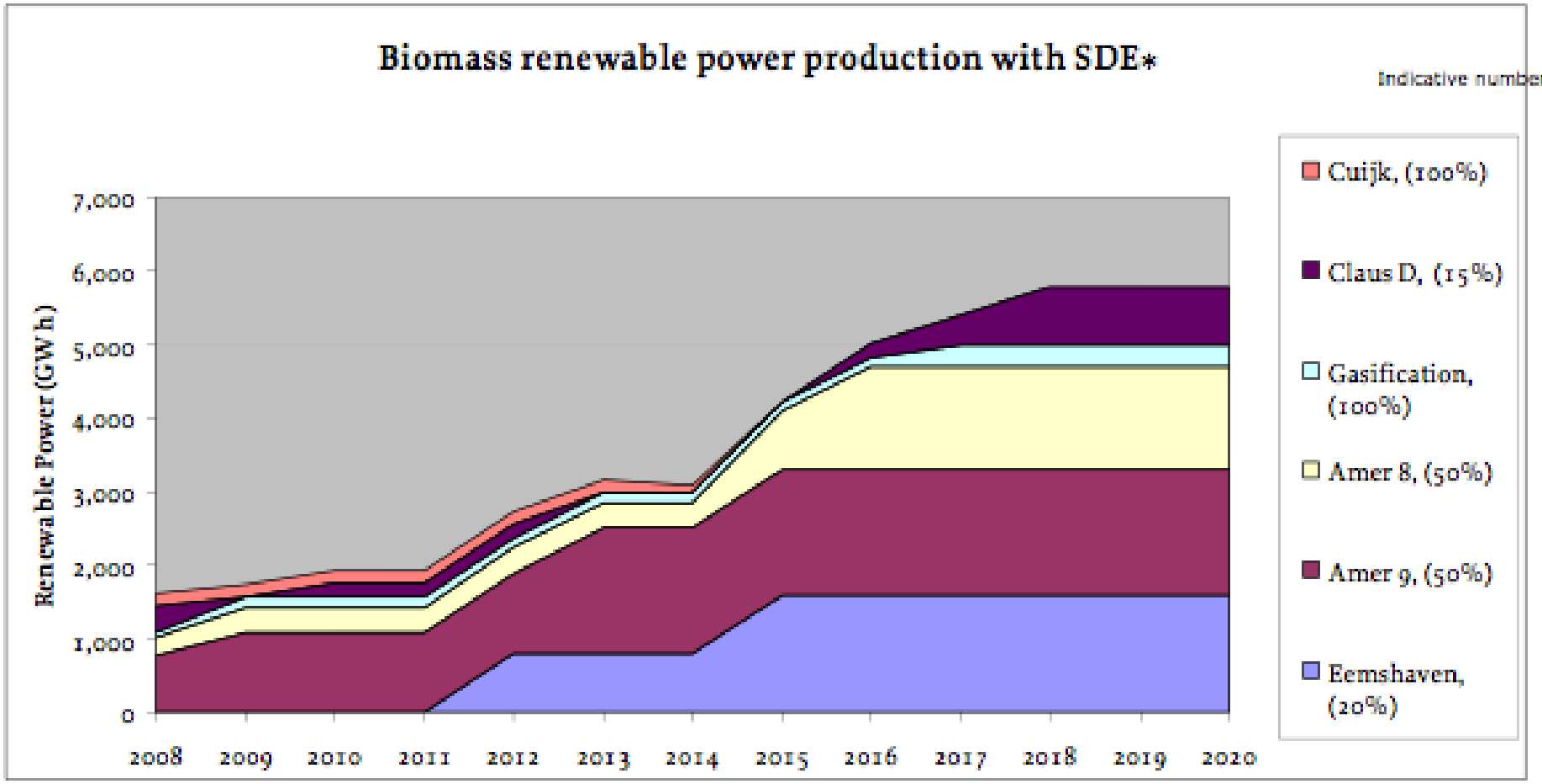
Projections for cofiring in the Netherlands with subsidies



Source: Essent, Essent Biomass Conference 2009

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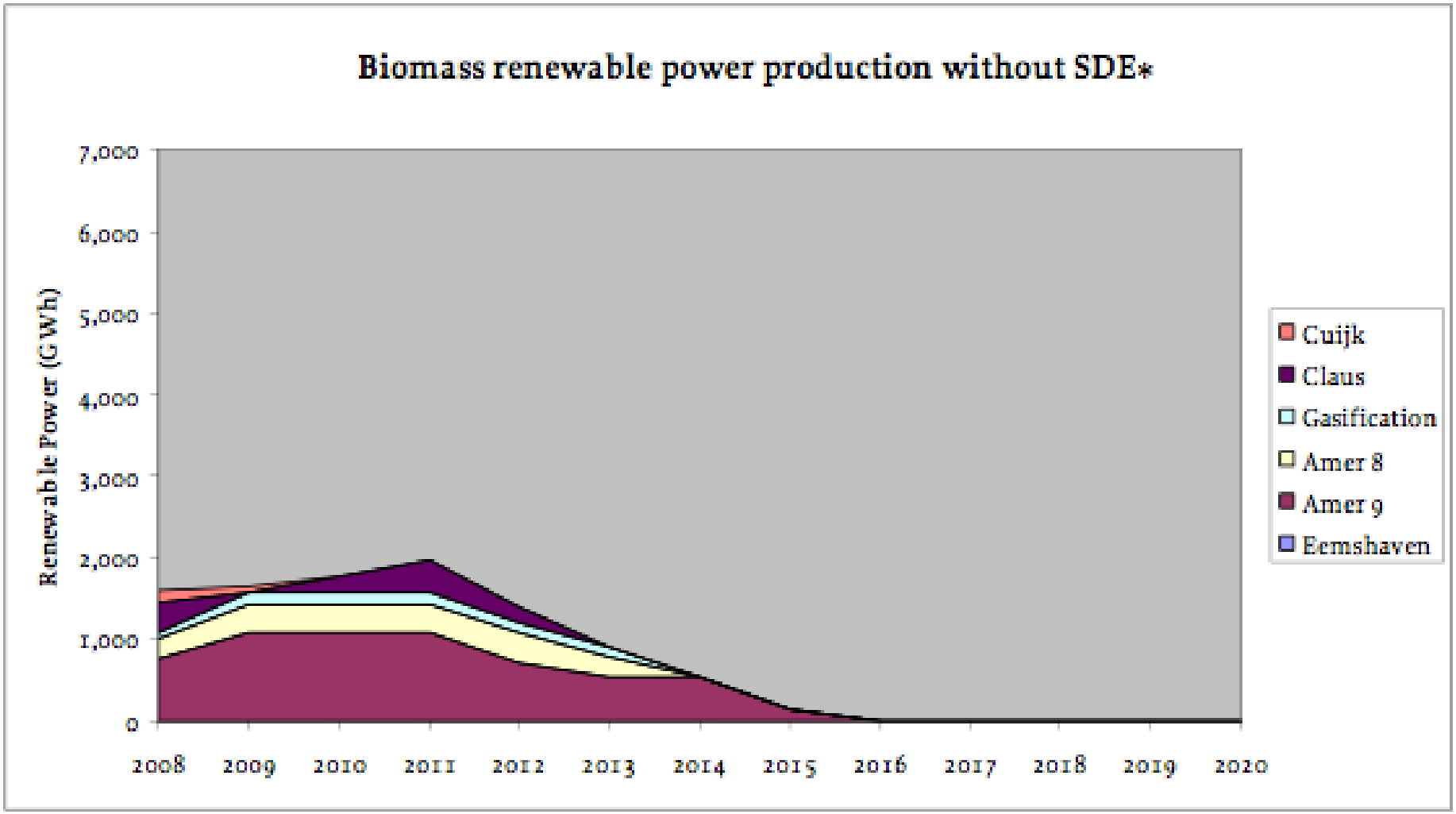
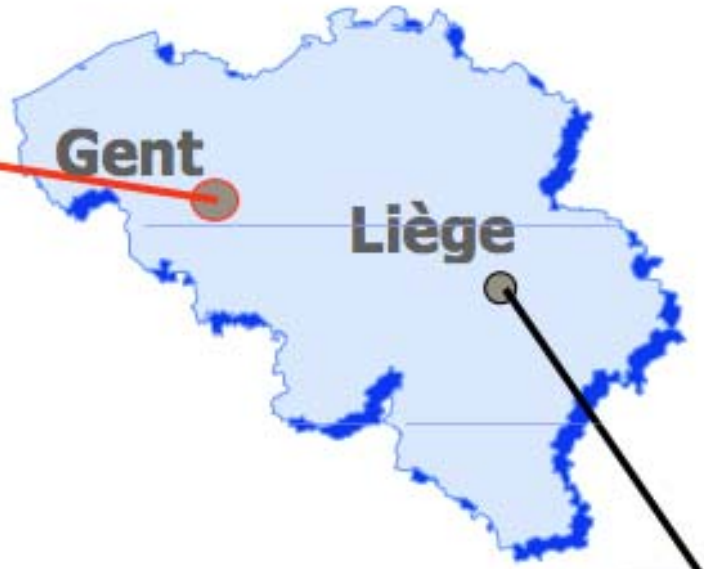
And without subsidy however .....



Source: Essent, Essent Biomass Conference 2009

Cofiring in Belgium / by GDF SUEZ

BE: WOOD PELLETS: about one million ton per year



LES AWIRS
80 MW
= 100%

RODENHUIZE
2nd step: 110 MW
= 60%

Both plants commissioned in Aug 2005

NL: Gelderland (Nijmegen)
co-firing >20% wood pellets (energy based)

500.000 tons/a fresh (8 PJ) woodpellets

➢General contractor: Geldof (Belgium)
Turnkey construction of biomass installation

- Pellets Unloading, transport, precleaning
- Storage, milling & transport to burners

➢Co-injection in primary air-coal dust lines

- Connection just before each burner (to prevent blockages in splitters)
- 24 blowers + 24 pneumatic lines to each burner

Coal fired power plant 600MWe
•built end 1970's
•equiped with DeNOx, DeSOx

➢867.000 MWhe per year or 132 MWe
➢787 kton CO2 avoided per year
➢Commissionning scheduled for Febr. 2010

POL: Polaniec power plant near Krakov

1680 MW, 8 PC boilers

From co-milling to co-injection

TODAY: Peak Units co-firing 500 kt/a of wood chips (12% energy) and agricultural biomass (straw briquettes, sunflower pellets)

2012: Base Units co-firing 1500 kt/a of agri-biomass pellets (20%)

Developments in other countries / by other utilities

- UK country with the greatest potential for growth: 27 projects with 18 Mill tons of pellet demand are discussed
- Dedicated power plants rather than cofiring are considered in UK: wood chip option ?
- Utilities with serious plans to expand pellet use: VATTENFAL , EON, DONG, RWE, GDF-SUEZ

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So whats the trends?

- Utilities trying to go upstream to secure supply
- No significant addition to demand 2011
- After 2012 huge increase in demand projected
- Uncertainties remain regarding policies in NL and UK
- BUT strongly supporting EU policies

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Certification of pellets: quality & sustainability

- Power producers very interested in establishing standard certification system
- Power sector demands clear requirements for sustainability from the EU
- EN + could become such a system that serves both heat market and power market needs

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Conclusions

- Strong market growth can be expected after 2012
- Certification of pellet production will become indispensable
- Wholesale dealers can make life significantly easier for producers
- Please support index providers
- Better pellet quality will give the producer the flexibility to serve both heat and electricity markets
- Dont put all eggs in one basket!

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Thank you for your attention !