

# CO2free from Fortum

- a great opportunity for “doing more good, not just less bad.”

- Global warming is upon us.
- Energy production is playing an important role.
- You can use your purchasing power to make a change.
- Ask for RECS certificates and change the future.



Fortum Markets  
Anette Nordskog



# *Power Play*

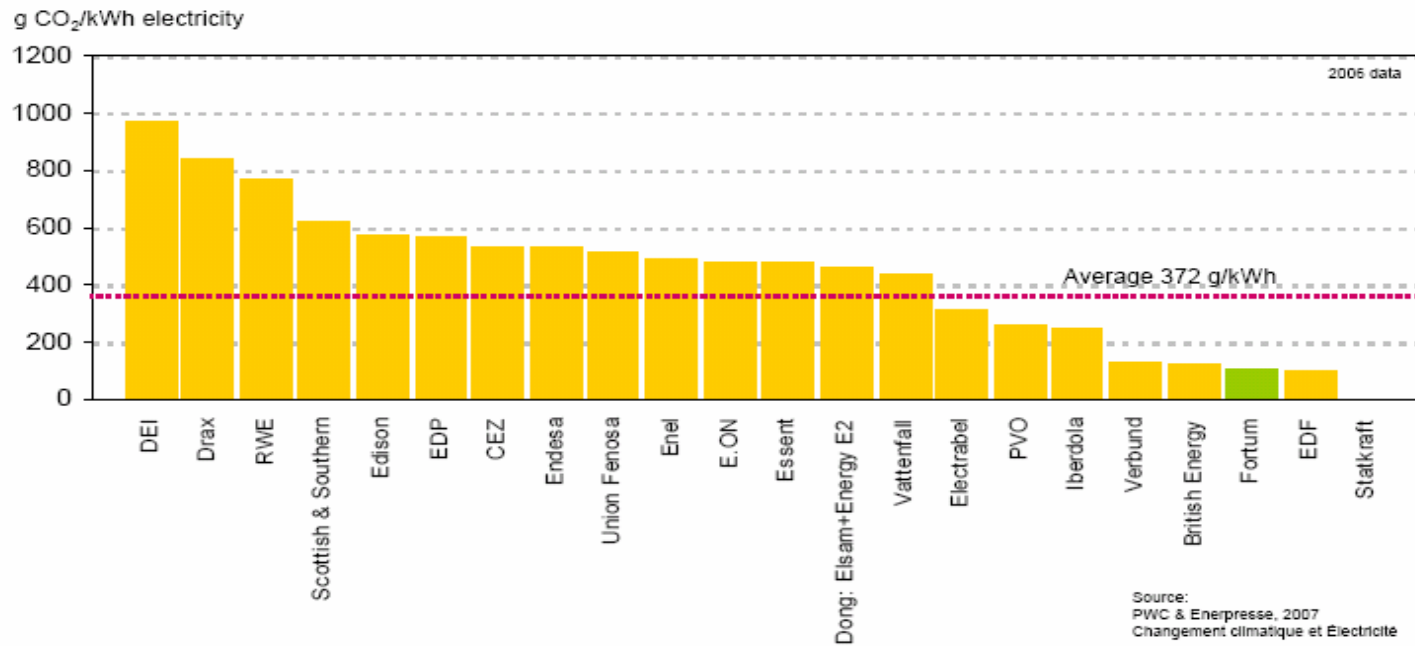
50%

2,4%

80%

40%

# Fortum's carbon exposure among the lowes in Europe

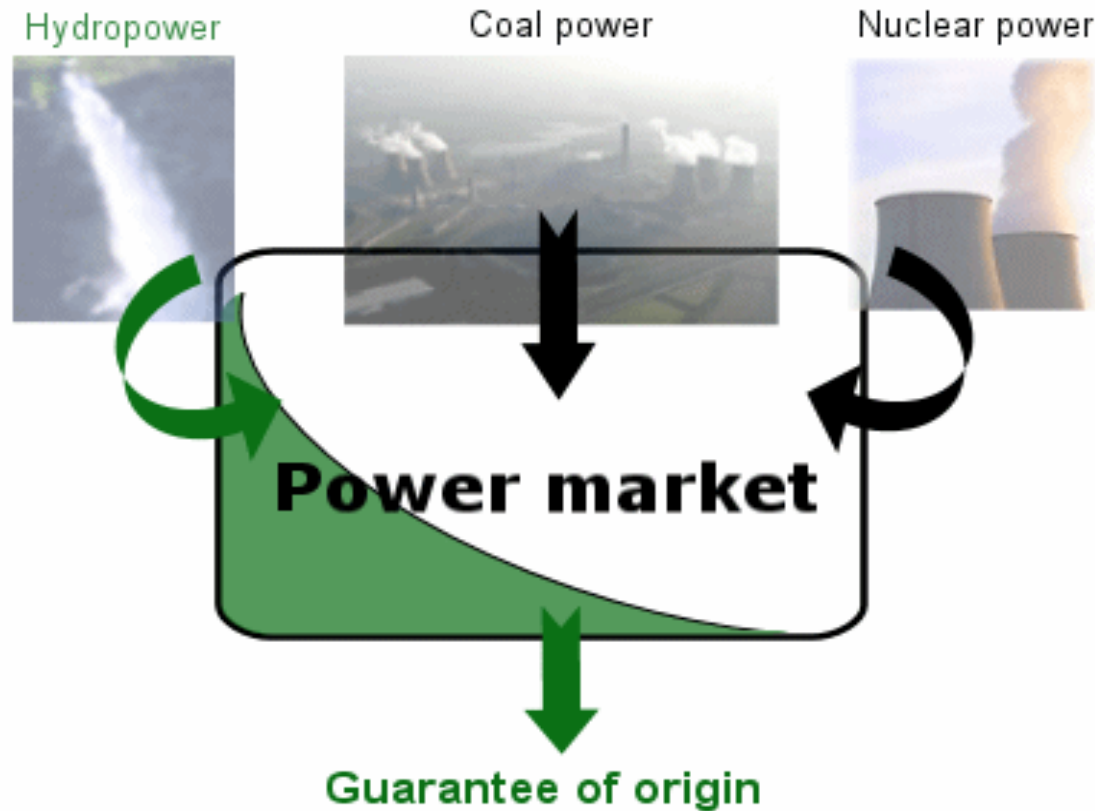


# Great timing

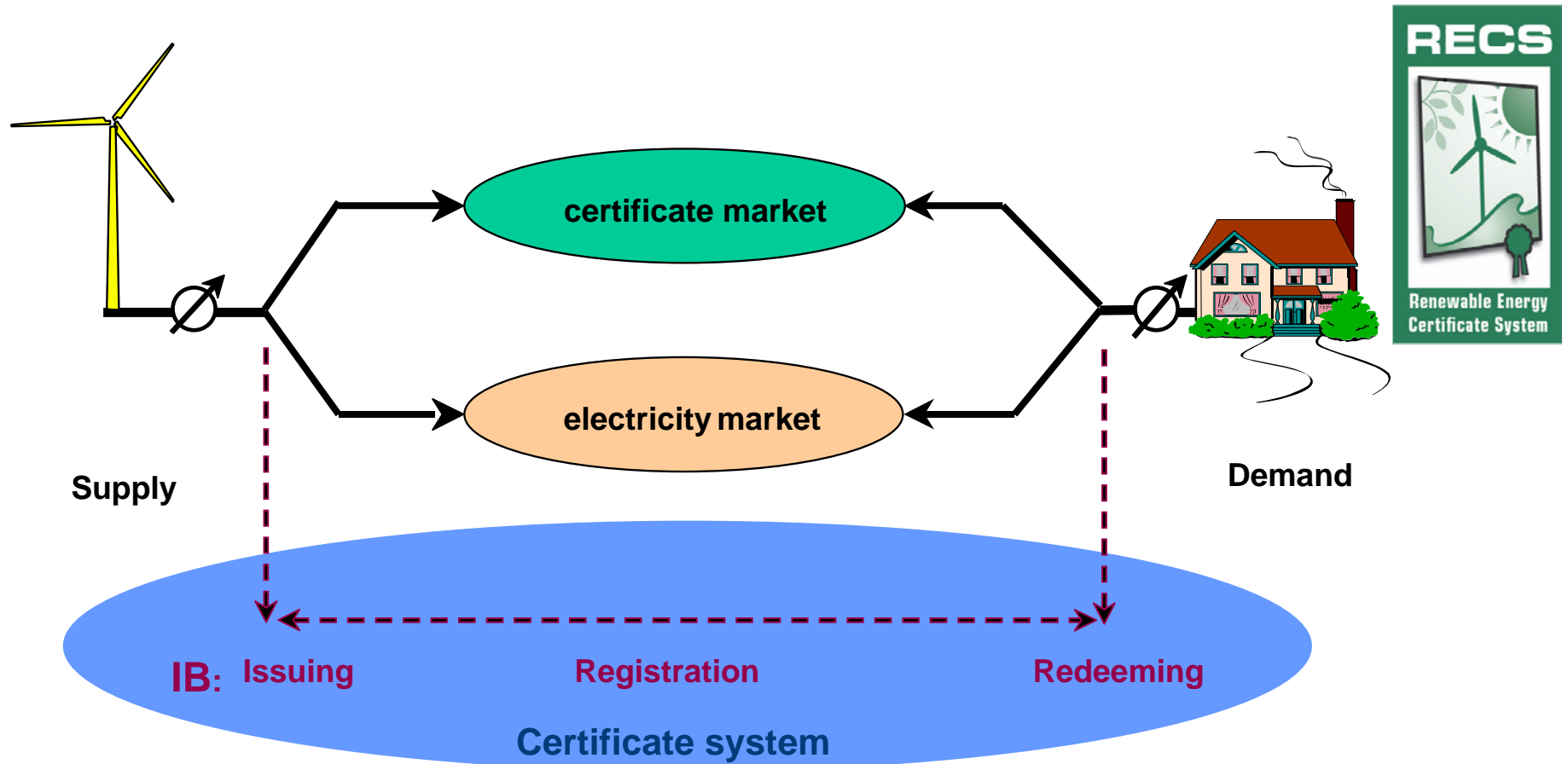
- Climate Change is rapidly becoming a mainstream issue.
- Customers feel helpless in stopping global warming
- We are approaching the tipping point for profitable solutions.
- This is business!



# Guaranties of origin



# Guaranties of Origin/ RECS



# The electronically traceable guarantee of origin

- One certificate represents 1 MWh of renewable energy production.
- Each certificate is unique with unique certificate number
- The certificate carries information about:
  - ✓ Production source
  - ✓ Production technology
  - ✓ Production domain
  - ✓ Time of production
  - ✓ Public support
  - ✓ Issuing body
- Certificate life: issue, transfer, redemption

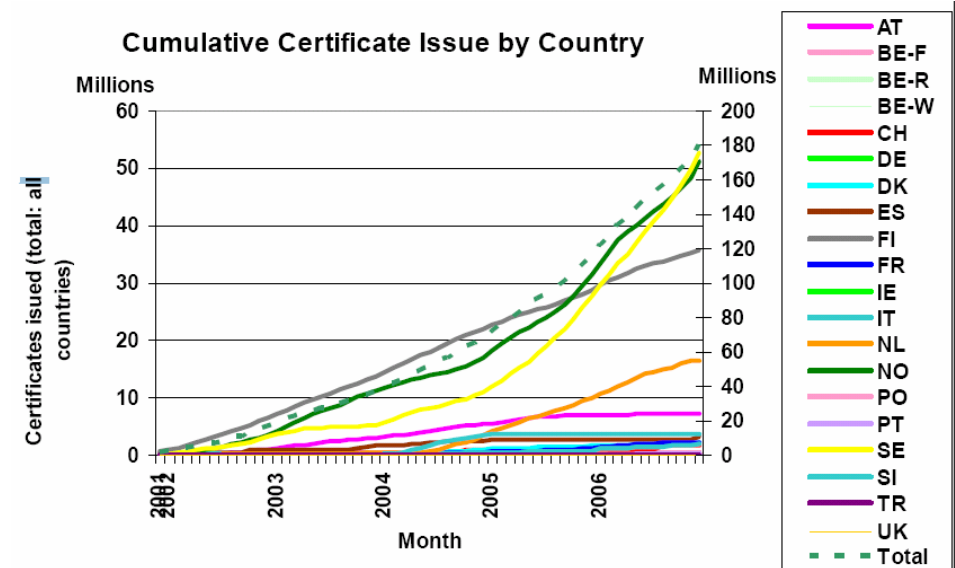
# Legal foundation:

## Pan European regulation:

- Guaranties of origin: RES directive (Directive 2001/77/EC on renewable energy)
  - ✓ Implemented in all European countries
  - ✓ New proposal is presented
- Energy declaration: EI market directive (Directive 2003/54/EC)
  - ✓ To strengthen consumers rights to information:
  - ✓ Inform customers about energy sources, three categories:
    - Renewable
    - Fossil
    - Nuclear
  - ✓ Inform customers about environmental impact:
    - Emissions of CO2
    - Nuclear waste.
- Public tenders: Green requirements in public tenders

# Renewable Energy Certificate System (RECS)

- **RECS is an electronic system for transferring "green values" between producers of renewable energy and consumers.**
  - ✓ Non profit organisation
  - ✓ European association based in Brussels
  - ✓ 200 members, 18 countries
  - ✓ 2006: Certificates from 63TWh renewable energy production was issued
- **History**
  - ✓ Start up phase 2000
  - ✓ Test Phase 2001-2002  
*Testing the systems*
  - ✓ Operational 2003-.....  
*Shaping the market*
- ✓ See [www.recs.org](http://www.recs.org) for more informasjon.



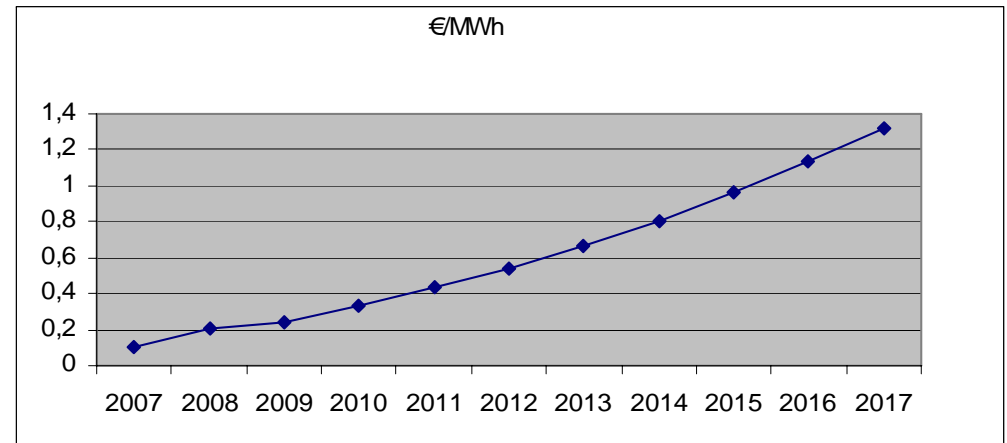
**RECS INSIDE**

**Does your Computer run on renewable energy?**

# Prisutvikling

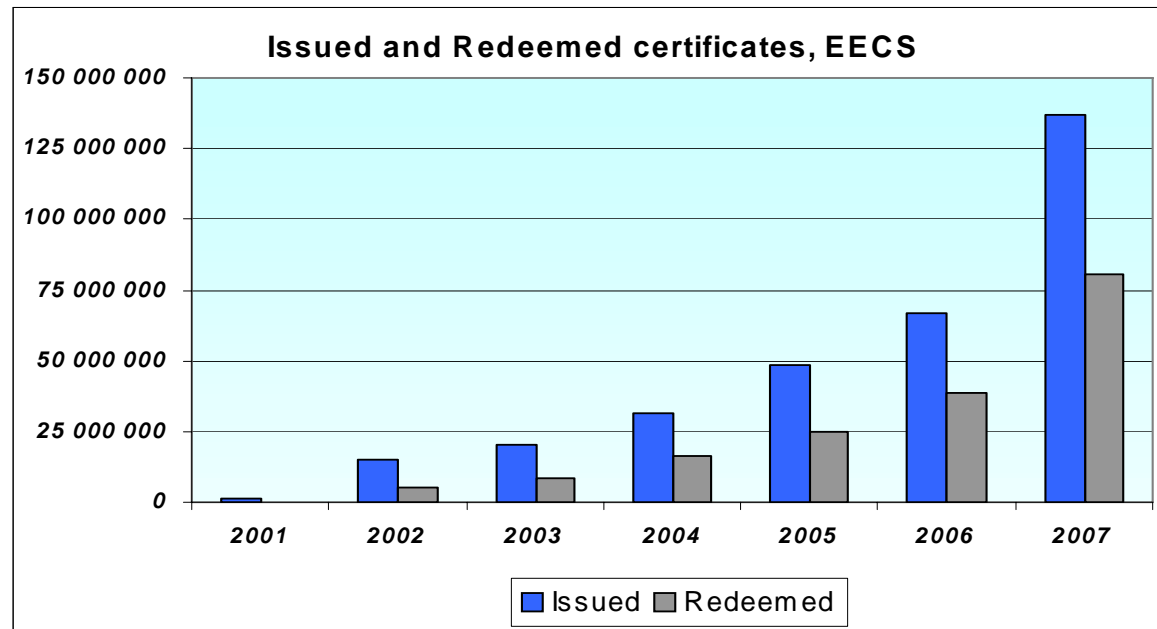
RECS auksjon, Amsterdam 9. april

- 5 handler på hydro
- Totalt 370 GWh omsatt
- Pris:
  - 2008: 0,205 €/MWh
  - 2010: 0,24 €/MWh
  - 2011: 0,44 €/MWh

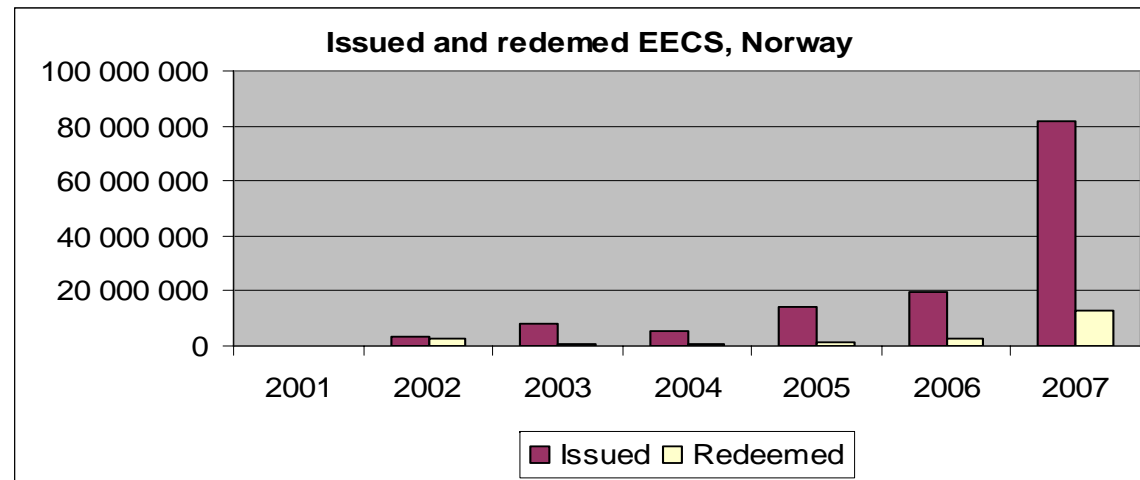


<b>NNV</b>	120	TWh	Norsk vannkraft
	2,14	NOK/MWh	Peis pr. goo, snittpris 5 år.
	kr	256 924 800	NOK/år
	Verdi pr. år		
5 %	kr	5 138 496 000	NOK/år
			Verdi av evigvarende kontantstrøm

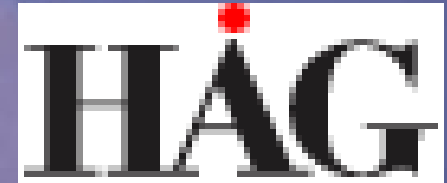
# Statistikk for sertifikathandel



# Statistikk, Norge



# Business example: HÅG



Before: Unsu

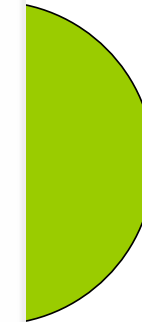
Nuclea



HÅG H09  
MILJØ

Når du velger HÅG bidrar du til å ta vare på miljøet. HÅG tar ansvar ved å utvikle produkter som reduserer det totale ressursforbruket. Det vil blant annet si at vi produserer mer for mindre og benytter resirkulerbare og resirkulerte materialer. På denne måten blir også arven til våre barn bedre.

able mix



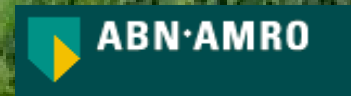
le;

100 %

Environmental impact from HÅG is reduced with:

- 57 kg radioactive waste
- 745 ton CO<sub>2</sub>

You never walk alone...



# Electricity Disclosure:



## Electricity Declaration

Company:

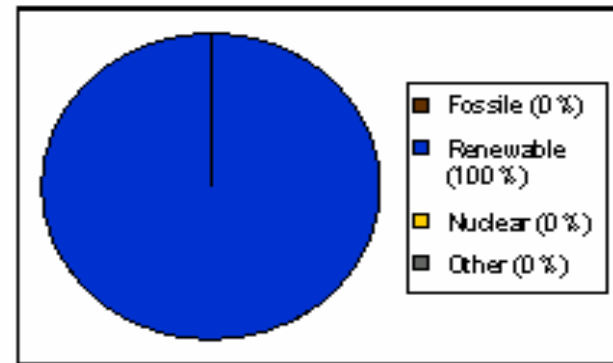
Consumer:

Scenario:

### Your electricity explained:

Global Warming Potential: 298,6 tonnes CO<sub>2</sub> eq  
 Radioactive waste: 0.12 kg

Declared Mix



Yearly electricity consumption: 100 000 000 kWh

Out of this, 100% is certified green energy.

		# certificates
99,00 %	HP (big, old) (2007)	99000
1,00 %	Wind (2007)	1000
1,00 %	Solar Power (2007)	1000

# Environmental report



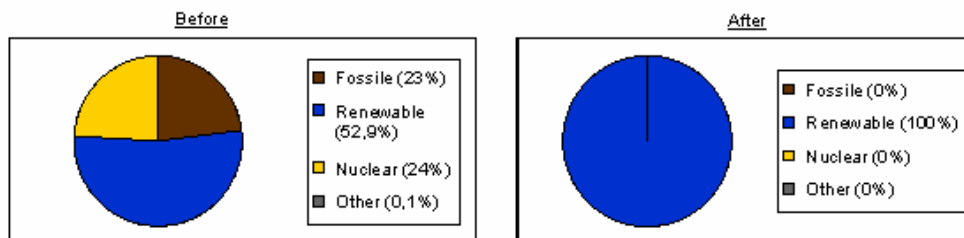
Company:  
Consumer:  
Scenario:

El. consumption (kWh): 100 000 000

## ELECTRICITY MIX

<u>Before</u>	<u>After</u>
Mix: 100 % NorPool (2007)	100 % of the original physical mix is replaced by certified green energy, as shown below.
	Certified green energy:
	99 % HP (big, old) (2007) 99 000 cert.
	1 % Wind (2007) 1 000 cert.
	1 % Solar Power (2007) 1 000 cert.
	Mix: 0 % NorPool (2007)

## COMPOSITION OF ENERGY CARRIERS



Impact category	Before	After	
Amount of renewable energy in mix	52,9	100,0	%
Amount of renewable energy in mix (life cycle perspective)	35,0	99,2	%
Global Warming Potential (GWP)	20 818,7	298,6	tonnes CO <sub>2</sub> eq
Photochemical Oxidation Creation Potential (POCP)	19 800,2	144,9	kg C <sub>2</sub> H <sub>2</sub> eq
Acidification Potential	106 852,7	1 737,9	kg SO <sub>2</sub> eq
Eutrophication Potential	7 083,9	293,4	kg PO <sub>4</sub> eq
Radioactive waste	1 441,13	0,12	kg
Particulates	31 780,5	388,8	kg
Total amount of energy used	254 684 035	121 094 125	kWh

## ECONOMY

Yearly certificate costs:	233 450,00 NOK	29 476,01 EUR
Average certificate costs:	2,31 NOK/MWh	0,29 EUR/MWh
Costs per saved CO <sub>2</sub> eq:	11,38 NOK/tonnes	1,44 EUR/tonnes



The environmental data used in this report are from 2007.



# For more information:

[www.co2fri.no](http://www.co2fri.no)

[www.recs.org](http://www.recs.org)

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