



RANKING POWER

SCORECARDS ELECTRICITY COMPANIES

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Table of contents

1	Introduction	4
2	Methodology	5
2.1	Ranking criteria	5
2.1.1	Criterion Current situation	6
2.1.2	Criterion Trend	8
2.1.3	Criterion Future Plans	9
2.2	Data gathering	9
2.2.1	Ownership and control	9
2.2.2	Disclosure	9
2.3	Selection of companies	10
3	Scorecards	11
3.1	Region 1: Western Europe	11
3.1.1	Current situation	13
3.1.2	Trend	16
3.1.3	Future plans	20
3.1.4	Ranking	22
3.2	Region 2: United States and Canada	23
3.2.1	Current situation	26
3.2.2	Trend	29
3.2.3	Future plans	33
3.2.4	Ranking	35
3.3	Region 3: Japan and Australia	36
3.3.1	Current situation	38
3.3.2	Trend	39
3.3.3	Future plans	43
3.3.4	Ranking	44
3.4	WWF PowerSwitch! Pioneers	45
4	Conclusion & discussion	47
4.1	Data availability and uncertainty	47
4.2	Current situation	47
4.3	Trend	48
4.4	Scorecards	48

5	Appendix	49
5.1	Data region 1: Western Europe	49
5.2	Data region 2: US and Canada	52
5.3	Data region 3: Japan and Australia	54
5.4	Included companies	57
5.5	Data sources and Internet links	59
5.5.1	General	59
5.5.2	Region 1: Western Europe	59
5.5.3	Region 2: US and Canada	61
5.5.4	Region 3: Japan and Australia	66
5.6	Letter Questionnaire	68
5.7	Questionnaire WWF	69
	Part 1: Fuel mix of current supply	69
	Part 2: Investments in new renewable electricity supplies	70
5.8	List of abbreviations	73

1 Introduction

WWF has launched its global Power Switch! public campaign aiming to persuade the power sector to become carbon neutral by mid of the 21st century. Clearly this is an important contribution to global greenhouse gas reductions as the power sector is responsible for 37% of global CO₂ emissions.

To support this campaign a report to develop scorecards for individual power companies was commissioned. This report aims at influencing the future behaviour of larger electricity companies in terms of fuel mix and investment choices via their (potential) customers and their (potential) investors. The overall goal is to stimulate the use of renewable energy sources (RES) and gas-CHP for electricity production.

Scorecards for electricity companies are included for three regions:

Region 1: Western Europe and Russia

Region 2: US and Canada

Region 3: Japan and Australia

The more than 70 companies included in this project are responsible for 65%¹ of total OECD electricity production.

¹ Based on the total electricity production of the included companies in 2002 and OECD electricity production in 2001 given by IEA (2003).

2 Methodology

The goal of this study is to rank larger electricity companies in terms of the use of renewable energy² (RE) and natural gas-fired Combined Heat and Power³ (gas-CHP). Gas-CHP refers to power plants that use a natural gas powered unit or facility to supply heat as well as electricity to consumers or industries.

The amount of CO₂ a company emits is explicitly not chosen as a criterion for ranking companies. This is because companies with relatively large shares of the power market would score high even if they had a responsible energy mix. In addition, companies with large-scale hydropower or nuclear energy would score high in the benchmark, while their share of renewable energy and gas-CHP may be relatively low. Both nuclear energy and large-scale hydropower are unacceptable future developments in the Power Switch! Campaign of WWF.

This study aims furthermore at increasing the disclosure of fuel mix and investment choices of electricity companies. The liberalisation of the electricity markets increases the need for information about companies' environmental performance by consumers who need to choose between suppliers. The EU Directive 2003/54/EC on the completion of the internal energy market in the European Community, requires electricity companies to disclose the fuel mix as well as the environmental quality of their electricity supplies. In the US, electricity companies have to report their produced electricity and correspondent fuel mix to the Energy Information Administration (EIA) of the US Department of Energy (US DOE).

2.1 Ranking criteria

The performance of electricity companies is determined by two criteria:

² Renewable energy is defined as renewable non-fossil and non-nuclear energy sources; wind, solar, geothermal, wave, tidal, small scale hydropower (< 10 MW), sustainable biomass, landfill gas, sewage treatment plant gas and biogases. Electricity from large-scale hydro power (unless certified by the World Commission on Dams), peat, and waste incineration are excluded.

³ WWF has chosen natural gas CHP as the second-best choice after sound renewables for a sustainable energy supply future. In the vast majority of countries a shift from coal, oil and nuclear base load power directly into renewables is presently not possible for a variety of reasons. As the shift from carbon-intensive coal to low-carbon natural gas for instance delivers many climate benefits it also reduces drastically conventional pollutants such as SO₂, heavy metals and dust. A shift from coal and other polluting sources to highly efficient combined heat and power (CHP) stations fired by natural gas is even better from reasons of energy conservation and overall pollution control. However, WWF sees natural gas only as a bridging technology for the next couple of decades. Ideally, in a sustainable and efficient energy system, clean renewables are the only 'legitimate' fuels.

- (1) ‘Current situation’; which evaluates the fuel mix of a company’s current electricity supply and
- (2) ‘Trend’; which refers to the quality of investments.

The companies receive grades for both criteria. The weight of the criteria ‘Current situation’ and ‘Trend’ in the final grade is respectively 40% and 60%. ‘Trend’ is given more importance in the ranking in order to lessen the influence of companies’ long-term history and put more emphasis on recent actions. This is consistent with the Power Switch! Campaign, which aims to influence future investments of electricity companies.

A third criterion, which is not graded in the ranking, is future plans of companies in the field of renewable energy and environment. The companies are divided into five categories ranging from no future plans to WWF PowerSwitch! Pioneer companies.

2.1.1 Criterion Current situation

Grades for the criterion ‘Current situation’ are based on the share of renewable energy and gas-CHP in the fuel mix of a company’s supplied electricity. The advantage of calculating the fuel mix on basis of supplied electricity is the inclusion of a company’s purchased electricity. This reflects the actual fuel mix of the electricity that customers buy from a company. This is however complex to calculate and seldom reported by companies themselves. For companies that produce most of the supplied electricity themselves we use the fuel mix from the production portfolio in generated electricity (TWh). If this is not available in terms of generated electricity we use the production portfolio based on installed capacity, and calculate the fuel mix by the assumed load hours in Table 1. Using installed capacity figures instead of generated power gives some uncertainty in the calculated fuel mix because the assumed load hours may be different from the actual load hours.

Table 1 Load hours for determining fuel mix from installed capacity

	Load hours for fuel mix ⁴
Coal	6300
Gas	3500
Oil	2500
Nuclear	7400
Wind	1800
Biomass	6000
Hydro	3300

For companies that purchase significant amounts of their electricity supply we calculate the fuel mix by the fuel mix of the generated electricity and the fuel mix of

⁴ Based on IEA (2003); average load hours for electricity generation in OECD countries.

the purchased electricity. As labelling of electricity is not yet implemented it is in most cases difficult to obtain information on the fuel mix of electricity purchased from an electricity exchange or through contracting. If no information is available about the fuel mix of these purchases, the average fuel mix of the country of origin of the electricity is used.

Table 2 shows the grades that are used to determine the score for the Current situation.

Table 2 Grades for share of renewable energy and gas-CHP in the fuel mix

Share RE and gas-CHP in fuel mix	Grade
≥ 80 - 100%	10
≥ 60 - < 80%	9
≥ 45 - < 60%	8
≥ 30 - < 45%	7
≥ 20 - < 30%	6
≥ 10 - < 20%	5
≥ 5 - < 10%	4
≥ 3 - < 5%	3
≥ 1 - < 3%	2
> 0 - < 1%	1
0%	0

The grade for Current situation is based on the separate grades for the share of renewable energy and the share of gas-CHP in total electricity supply. The weighting factors that are used to determine the overall grade are 60% for renewable energy and 40%⁵ for gas-CHP. More importance is given to the share of renewable energy than to the share of gas-CHP because renewable energy has less environmental impact than gas-CHP.

This methodology works well if companies have shares of renewable energy and gas-CHP smaller than 50%. This is true for the companies included in this study. If shares are larger than 50% there will be a certain competition between the grade for renewable energy and the grade for gas-CHP as both cannot be larger than 50% at the same time.

⁵ WWF acknowledges that sustainable renewable energies are zero-emitting sources whereas natural gas as a fossil fuel emits carbon although comparatively low. Because there are huge opportunities to cut carbon drastically by switching from coal to natural gas in many countries, this "clean" fossil fuel receives 40% of the share for the joint ranking compared to renewables that receive 60%.

2.1.2 Criterion Trend

The criterion ‘Trend’ is used to determine the extent to which companies invest in renewable energy and gas-CHP. Indicators for the criterion Trend are the share of renewable energy and gas-CHP in:

- (1) Historic investments (or installed capacity) in the period 1992-2004 and
- (2) Planned capacity (> 2004).

The score for the Trend criterion is determined by the non-weighted average of the above shares. Grading is based on the numbers in Table 3. These are the same grades as the ones that are used for the Current situation criterion.

Table 3 Grades for share of total investments in RE and gas-CHP

Share RE and gas-CHP in fuel mix	Grade
≥ 80 – 100%	10
≥ 60 - < 80%	9
≥ 45 - < 60%	8
≥ 30 - < 45%	7
≥ 20 - < 30%	6
≥ 10 - < 20%	5
≥ 5 - < 10%	4
≥ 3 - < 5%	3
≥ 1 - < 3%	2
> 0 - < 1%	1
0%	0

The grade for Trend is based on the separate grades for RE and gas-CHP. The weighting factors that are used to determine the overall grade for Trend are 60% for renewable energy and 40% for gas-CHP.

Important for a comparison between companies is not only the relative investments in renewable energy and gas-CHP capacity but also the absolute investments in comparison to the total installed capacity. In case the investments in new capacity are very small in comparison to the already installed capacity (< 1%), the grade may be adjusted. This will be done in order to prevent companies scoring a very high grade when the total planned or installed capacity is very small in comparison to overall capacity. In case the amount of RE or gas-CHP is known but the total investments are unknown, the grade will be 1 instead of 0.

2.1.3 Criterion Future Plans

The criterion “Future Plans” aims to reflect long-term plans of companies in the field of renewable energy and environment. The companies are divided into five categories:

- A: WWF PowerSwitch! Pioneer. These companies have region specific long-term goals such as (1) no more investments into coal, (2) at least 20% renewable energy by 2020 and (3) extensive commitment to energy-efficiency and gas-CHP.
- B: Extensive environmental report is available, ambitious targets are set for new renewable energy capacity.
- C: Extensive environmental report is available, moderate targets or plans are present for new renewable energy capacity. Efforts are put into energy-efficiency and CO₂ emission reduction.
- D: Environmental report is available, but no plans or targets are present regarding renewable energy or gas-CHP. Efforts in the field of energy-efficiency and CO₂ emission reduction are present but limited.
- E: No environmental report is available, limited information is available on websites regarding environmental efforts.

2.2 Data gathering

The data for this analysis is collected in two ways. The first way is by requesting data from companies in a questionnaire (see Appendix 5.6 and 5.7). The second information source is publicly available data. As only a limited number of companies participated in the questionnaire, most data was gathered from companies’ annual (environmental) reports and publicly accessible websites (references are provided in Appendix 5.5). The data availability in annual reports is sufficient to determine the fuel mix of most of the companies. However, the annual reports provide very limited and non-uniform data with respect to the fuel mix in investments, making it quite difficult to determine final scorings for the Trend-criterion. The complex ownership and control structure of many (multi-national) utilities increases the non-transparency of available information.

2.2.1 Ownership and control

To avoid confusion on companies’ boundaries we use data on the level of the holding company, based on plant ownership. For every company we aim to take into account the worldwide supply of electricity. This analysis reflects the ownership structure as reported in the most recent annual report.

2.2.2 Disclosure

The willingness of companies to disclose information is an important item in the ranking of companies. The willingness to disclose information is visible in the re-

turning of the questionnaire and the publication of data in annual reports. The extent, to which a company discloses information, impacts its final score in the rankings. If no information is available on a criterion then we use the term Data Deficient (DD). DD is assumed to be zero when determining a company's overall grade.

2.3 Selection of companies

In this study we include large electricity companies that are based in one of the following regions:

1. Western Europe and Russia;
2. US and Canada;
3. Japan and Australia.

Companies are selected based on size and nationality. In region 1 we have included twenty-one European electricity companies. For region 2 we selected twenty-nine US companies and two Canadian companies. Region 3 includes twelve Japanese companies and the eight largest Australian companies. The company list is included in Appendix 5.4.

3 Scorecards

3.1 Region 1: Western Europe

Figure 1 shows total electricity supply of companies in 2003. If 2003 data is not available, data for 2002 or the most recent year available is used. The underlying data for this graph can be found in Table 16 in Appendix 5.1.

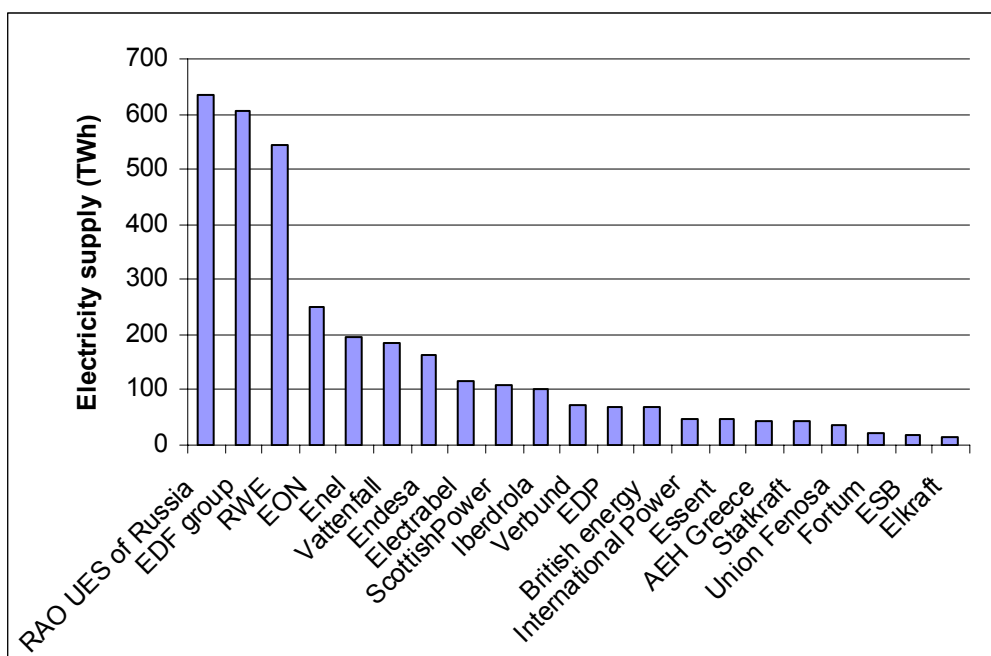


Figure 1 Electricity supply (TWh) in 2002 or 2003

For a number of companies no data was available on supplied electricity. In this case the numbers in Figure 1 reflect produced electricity. This is valid for the companies: British energy, EDF group, Electrabel, ESB, Statkraft, Union Fenosa and International Power.

Figure 1 shows that RAO-UES has the largest amount of electricity supply: 636 TWh in 2003. The second largest electricity company is EDF with a worldwide electricity production of 605 TWh, of which 487 TWh in France. RWE has an electricity supply of in total 544⁶ TWh worldwide in 2002.

⁶ Including Innogy (136 TWh). RWE (2003); Annual Report 2002.

Figure 2 shows the fuel mix of electricity supply in 2002 or 2003.

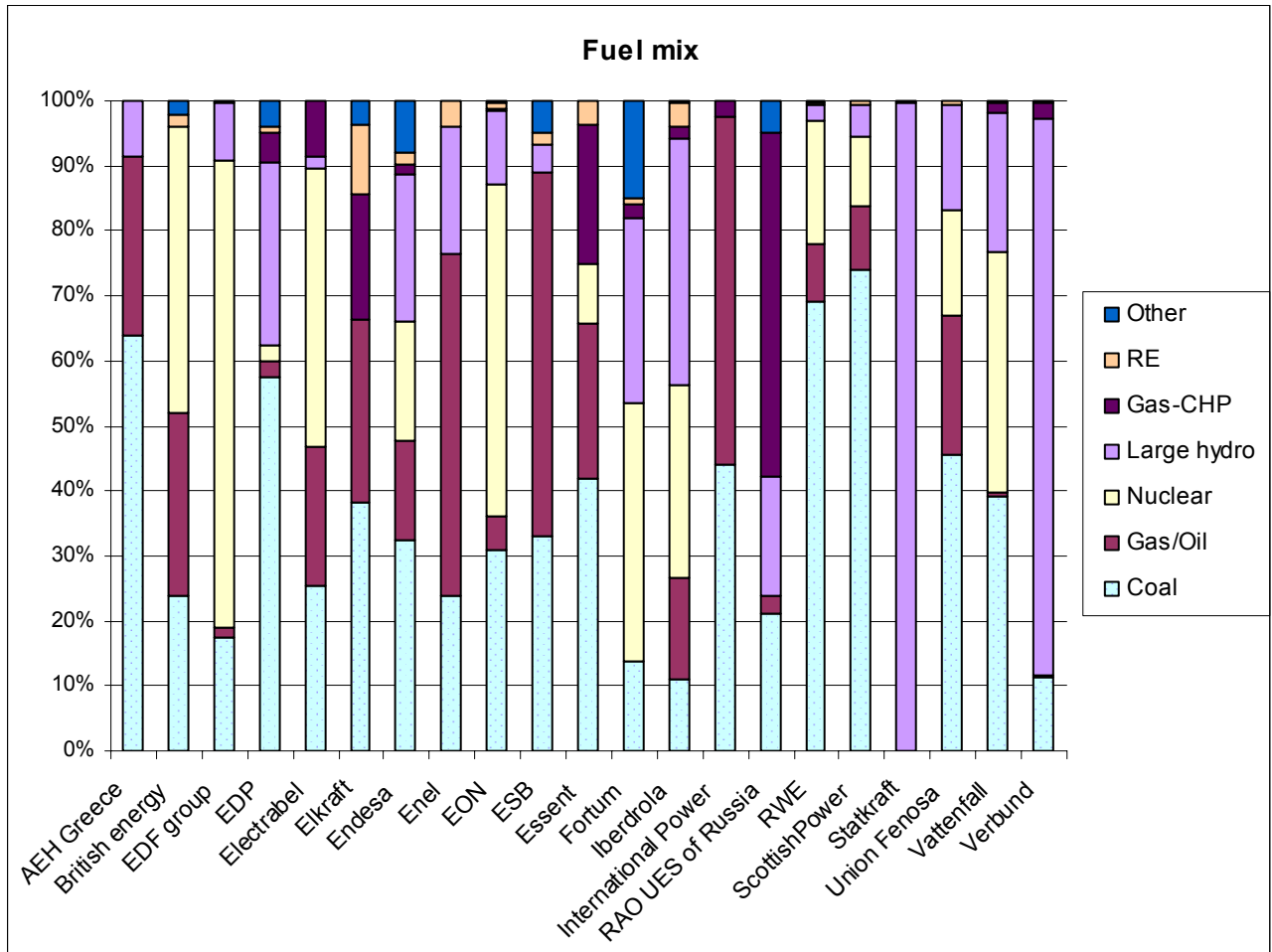


Figure 2 Fuel mix of supplied electricity in 2002 or 2003

Figure 2 shows that coal and hydropower are the most frequently used energy sources for electricity generation, followed by nuclear power and natural gas.

The fuel mix is based on supplied electricity for the companies: British energy, Fortum, Iberdrola, RAO UES of Russia and ScottishPower. For the other companies the fuel mix is based on produced electricity. This applies as well to Figure 2 as to all figures in section 3.1.1.

3.1.1 Current situation

This section gives an overview of the current situation for companies in region 1.

Figure 3 and Figure 4 show the absolute amount of electricity supply by respectively renewable energy and gas-CHP.

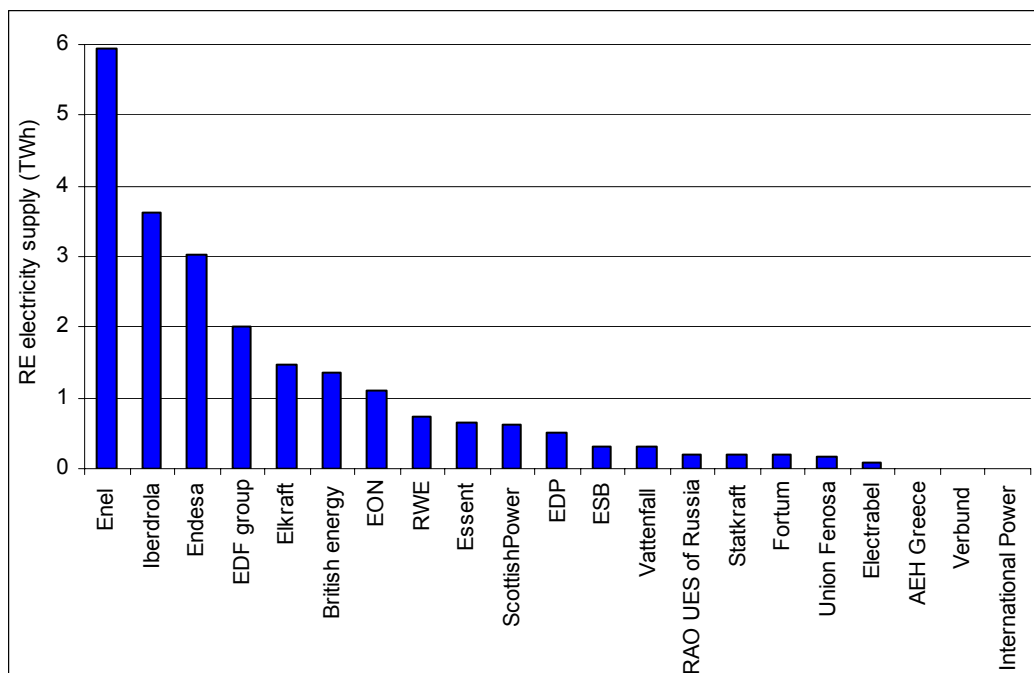


Figure 3 Electricity supply based on renewable energy (excl. large hydro) in 2002/2003

In absolute terms, Enel has the largest amount of renewable electricity generation, followed by Iberdrola and Endesa. Renewable electricity generation from Enel is primarily based on geothermal electricity.

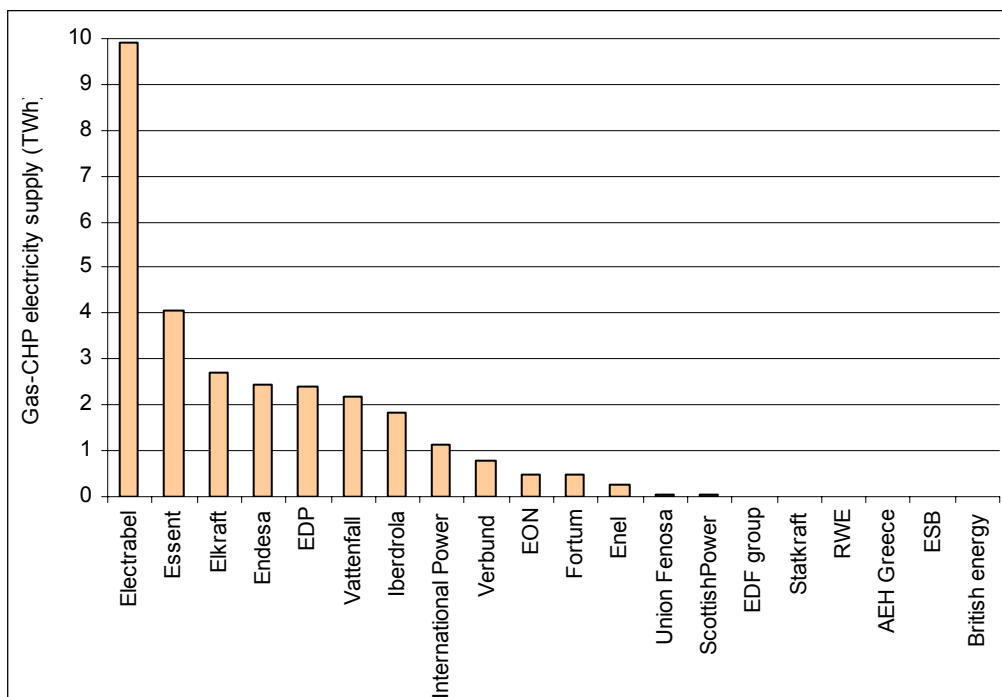


Figure 4 Electricity supply based on gas-CHP in 2002/2003 (excluding RAO-UES)

RAO UES generates by far the most electricity by gas-CHP: 335 TWh in 2003. RAO UES is not included in Figure 4 because of visibility reasons. After RAO UES, Electrabel has the largest amount of gas-CHP electricity generation: 10 TWh in 2002.

Figure 5 and Figure 6 show the share of renewable energy and gas-CHP in supplied electricity in 2003/2002.

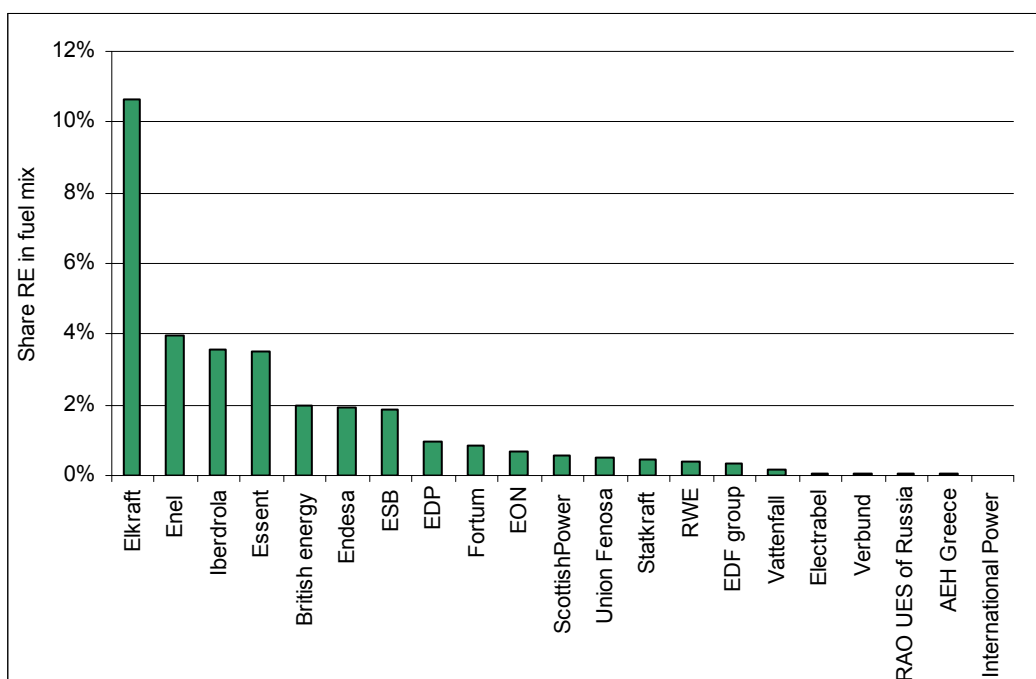


Figure 5 Share of RE (excl. large hydro) in supplied electricity in 2002/2003

In relative terms Elkraft⁷ has the largest share of renewable energy in their fuel mix: 10.6% in 2002. Elkraft’s renewable electricity supply is mainly based on wind energy and biomass. Enel, Iberdrola and Essent follow by respectively 4.0% and 3.5%. As can be seen in the figure, the share of renewable electricity supply in total electricity supply is smaller than 1% for 65% of the companies in region 1. Only four companies out of twenty-one have shares larger than 2%.

⁷ On 27 June 2000, Elkraft split in two. Elkraft continued as the transmission company. The power production company was called Energi E2.

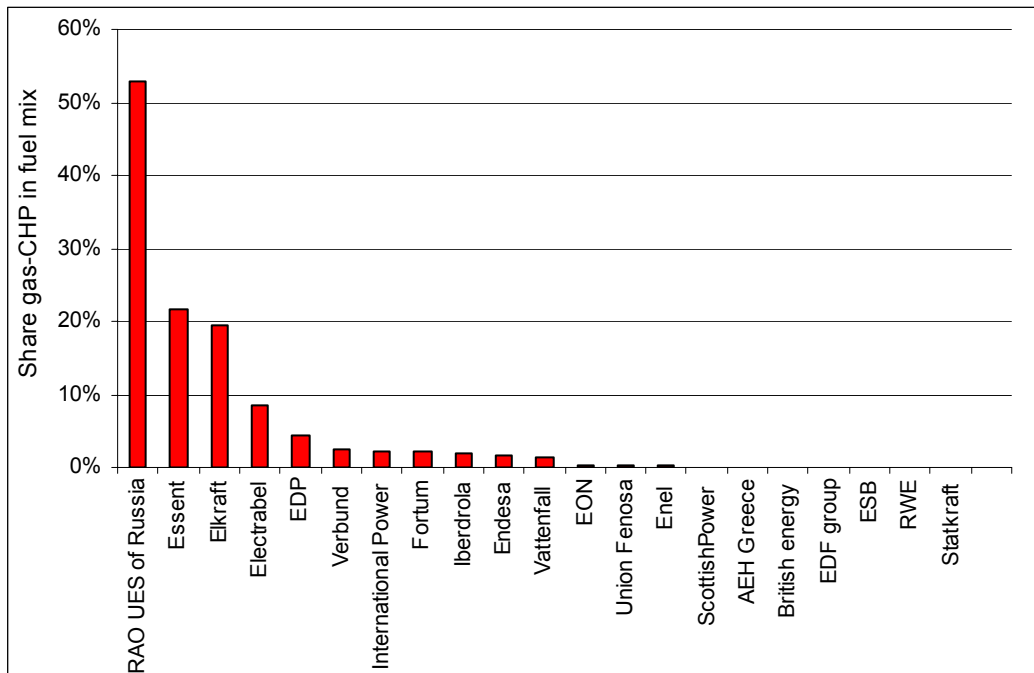


Figure 6 Share of gas-CHP in supplied electricity in 2002/2003

Figure 6 shows that RAO UES has the largest share of gas-CHP in its fuel mix: 53% in 2002, followed by Essent and Elkraft (respectively 22% and 20%). Besides the first four companies, all companies have shares below 5%.

3.1.2 Trend

This section gives an overview of the trend for companies in terms of renewable energy and gas-CHP use. The information in this section is not complete, because data regarding investments were very difficult to obtain and contain large uncertainties. The companies Enel, EDP, Vattenfall, Fortum, Union Fenosa and ESB are not included in the figures because no data on investments in renewable energy and gas-CHP was found in this study. The underlying data for the graphs can be found in Table 18 in Appendix 5.1.

Figure 7 and Figure 8 show the installed and planned capacity for companies respectively bigger and smaller than 15 GW. The figures distinguish between installed capacity before 1992, installed capacity installed after 1992 and planned capacity. The installed capacity after 1992 and the planned capacity are divided in renewable energy, gas-CHP and other capacity. ‘Other capacity’ means all capacity other than renewable energy and gas-CHP. Where the date of the commissioning of the installed capacity is not known, the term ‘Capacity date unknown’ is used. This means that it is not clear whether the capacity was installed before or after 1992.

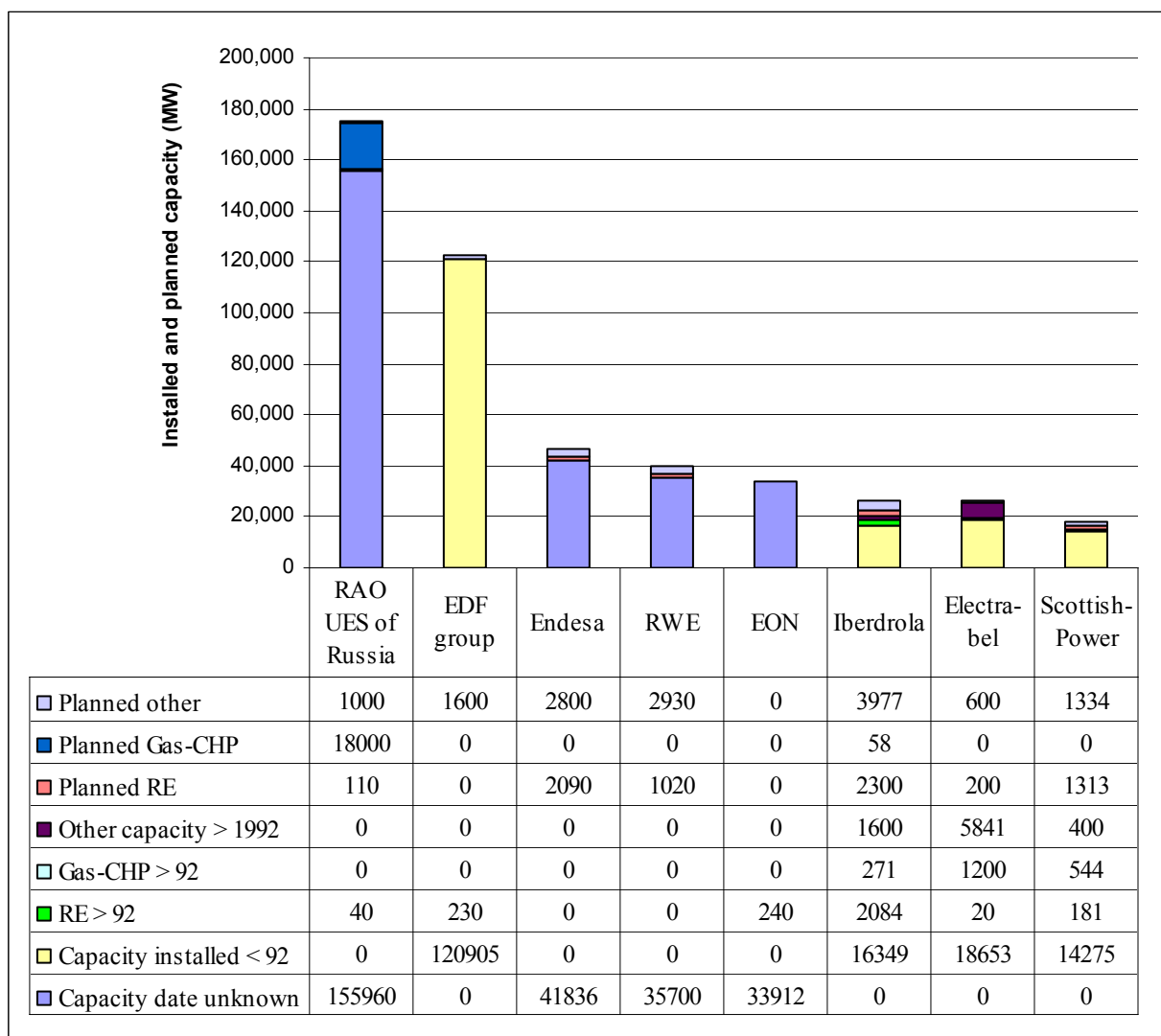


Figure 7 Installed and planned capacity (MW) for companies larger than 15 GW

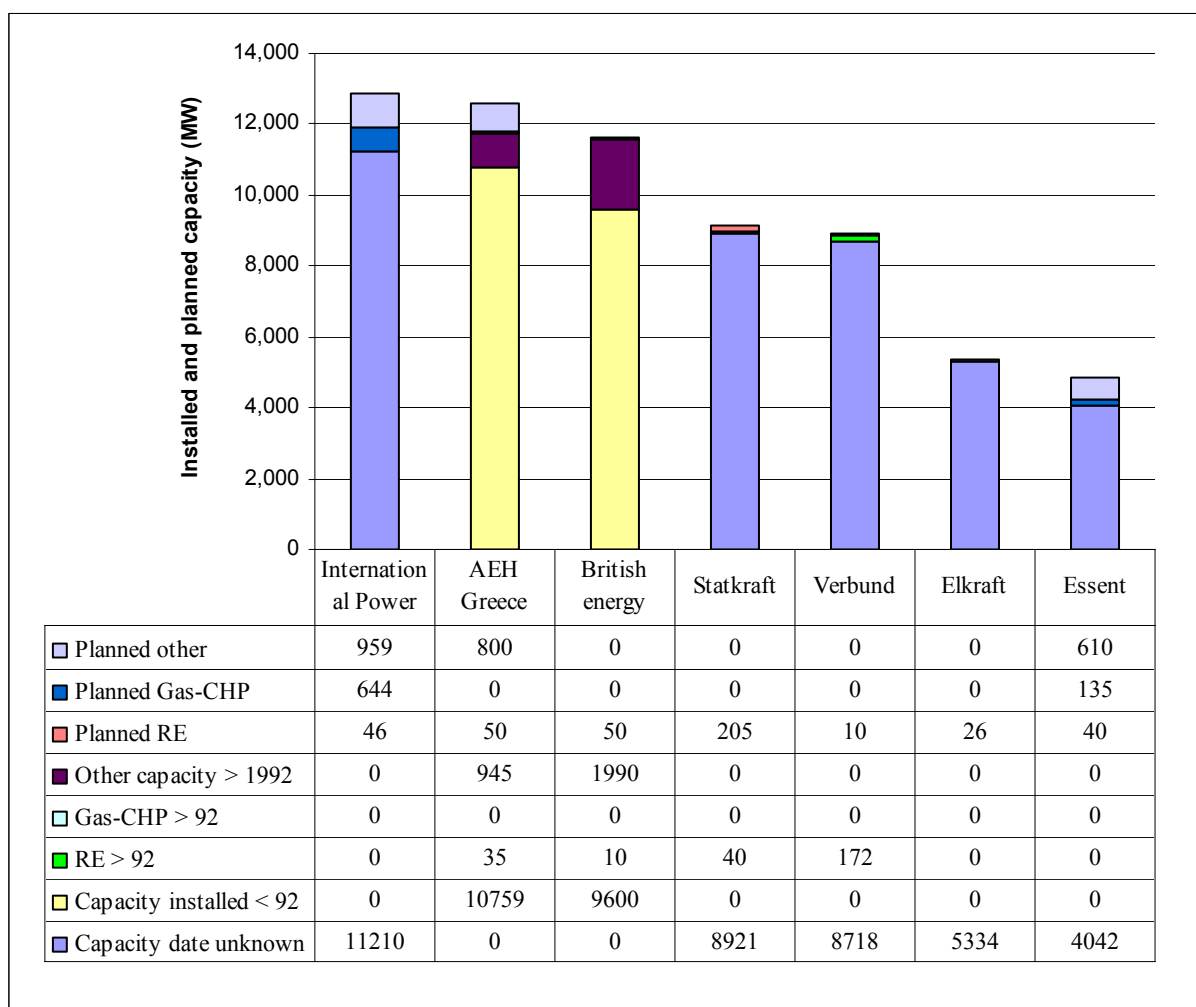


Figure 8 Installed and planned capacity (MW) for companies smaller than 15 GW

According to Figures 7 and 8, Endesa, RWE, Iberdrola, ScottishPower, AEH, Statkraft and Verbund show significant amounts of investments in renewable energy in their total investments. RAO-UES, International Power, Iberdrola and Essent show significant amounts of investments in gas-CHP.

Historic investments (1992-2004)

Table 4 shows the share of renewable energy and gas-CHP in investments in new capacity in the period 1992-2004 and the corresponding grades. The table is sorted by the grades for renewable energy. 'Share in historic investments' means the investments in RE and gas-CHP in comparison to total investments in the period 1992-2004. 'Share in total capacity' means new RE and gas-CHP capacity divided by total installed capacity. The grades are based on the share of RE and gas-CHP in total historic investments according to the grading system given in Table 3 in sec-

tion 2.1.2. The grade for EDF group has been adjusted from 10 to 6, because the total new capacity is very small in comparison to the total capacity (< 1%).

Table 4 Share RE and gas-CHP in historic investments (1992-2004)

Company	Total capacity	New capacity > 1992 (MW)			Share in historic investments		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
Iberdrola	20304	3955	2084	271	53%	7%	10%	1%	8	4
EDF group	121135	230	230	n.a.	100%	n.a.	0%	n.a.	6	0
ScottishPower	15400	1125	181	544	16%	48%	1%	4%	5	8
AEH Greece	11739	980	35	n.a.	4%	n.a.	0%	n.a.	3	0
Electrabel	25714	7061	20	1200	0%	17%	0%	5%	1	5
EON	34152	n.a.	240	n.a.	n.a.	n.a.	1%	n.a.	1	0
Verbund	8890	n.a.	172	n.a.	n.a.	n.a.	2%	n.a.	1	0
RAO UES of Russia	156000	n.a.	40	n.a.	n.a.	n.a.	0%	n.a.	1	0
Statkraft	8961	n.a.	40	n.a.	n.a.	n.a.	0%	n.a.	1	0
British energy	11600	2000	10	n.a.	1%	n.a.	0%	n.a.	1	0

Table 4 shows that Iberdrola has the largest absolute amount of new renewable energy capacity in the period 1992-2004, followed by EON and EDF. For gas-CHP Electrabel has the largest absolute amount followed by ScottishPower and Iberdrola.

Planned investments

Table 5 shows the share of renewable energy and gas-CHP in planned capacity. The table is sorted by the grade for planned renewable energy capacity. ‘Share in planned capacity’ means the share of planned RE and gas-CHP in total planned capacity. ‘Share in total capacity’ means the amount of planned RE and gas-CHP divided by total installed capacity. The grades are based on the share of RE and gas-CHP in total planned capacity according to the grading system given in Table 3 in section 2.1.2. For a number of companies the grades have been adjusted to take into account the relatively low planned capacity (< 1% of total capacity). These companies are Elkraft and Verbund. Grades have been adjusted from 10 to respectively 4 and 2.

Table 5 Share RE and gas-CHP in planned capacity

Companies	Total capacity	Planned capacity (MW)			Share in planned capacity		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
Statkraft	8961	205	205	n.a.	100%	n.a.	2%	n.a.	10	0
ScottishPower	15400	2647	1313	n.a.	50%	n.a.	9%	n.a.	8	0
Iberdrola	20304	6335	2300	58	36%	1%	11%	0%	7	1
Endesa	41836	4890	2090	n.a.	43%	n.a.	5%	n.a.	7	0
Electrabel	25714	800	200	n.a.	25%	n.a.	1%	n.a.	6	0
RWE	35700	3950	1020	n.a.	26%	n.a.	3%	n.a.	6	0
Essent	4042	785	40	135	5%	17%	1%	3%	4	5
AEH Greece	11739	850	50	n.a.	6%	n.a.	0%	n.a.	4	0
Elkraft	5334	26	26	n.a.	100%	n.a.	0%	n.a.	4	0
International Power	11210	1649	46	644	3%	39%	0%	6%	2	7
Verbund	8890	10	10	n.a.	100%	n.a.	0%	n.a.	2	0
RAO UES of Russia	156000	19110	110	18000	1%	94%	0%	12%	1	10
British energy	11600	n.a.	50	n.a.	n.a.	n.a.	0%	n.a.	1	0

Companies with large amounts of planned renewable energy capacity are Iberdrola, Endesa, ScottishPower and RWE. For gas-CHP the companies with large amounts of planned capacity are RAO-UES and International Power.

3.1.3 Future plans

In Table 6, the companies are divided into five categories. The table is based on environmental reports and reflects long-term plans of companies regarding renewable energy sources, energy-efficiency and carbon abatement. For a description of the categories see section 2.1.3. The table is sorted by category and by alphabet.

Table 6 Future plans of companies in region 1

	A (PowerSwitch! Pioneer)	B	C	D	E
Endesa		X			
Iberdrola		X			
ScottishPower		X			
Statkraft		X			
AEH Greece			X		
British energy			X		
EDF group			X		
Electrabel			X		
Enel			X		
EON			X		
Essent			X		
Fortum			X		
International Power			X		
RAO UES of Russia			X		
RWE			X		
Scottish & Southern			X		
Vattenfall			X		
Verbund			X		
EDP				X	
Elkraft				X	
Union Fenosa				X	
ESB					X

Explanation:

- A: WWF PowerSwitch! Pioneer.
- B: Ambitious targets for renewable energy.
- C: Moderate targets for renewable energy.
- D: No targets or plans for renewable energy.
- E: Little information available on environmental efforts.

3.1.4 Ranking

Table 7 shows the ranking of companies in region 1. The table is sorted on “Overall grade”. In case the overall grade for companies is equal, the companies are sorted alphabetically. The methodology for ranking can be found in chapter 2. The shading of the cells reflects the performance of companies. Cells with grades between 0 and 1 are shaded red and cells with values of 6 or higher are shaded green.

Table 7 Ranking of companies in region 1⁸

	Companies	Country	Responded to Questionnaire	Current situation			Trend			Overall grade
				Gas-CHP	RE	Total	Gas-CHP	RE	Total	
1	Iberdrola	Spain	Yes	2	3	2.6	3	8	5.5	4.3
2	ScottishPower	UK	Yes	1	1	1.0	4	7	5.5	3.7
3	RAO UES of Russia	Russia	Yes	8	1	3.8	5	1	2.6	3.1
4	Essent	Netherlands		6	3	4.2	3	2	2.2	3.0
5	Electrabel	Belgium		4	1	2.2	3	4	3.1	2.7
6	Elkraft	Denmark		5	5	5.0	DD	2	1.2	2.7
7	Statkraft	Norway		0	1	0.6	DD	6	3.3	2.2
8	Endesa	Spain		2	2	2.0	DD	4	2.1	2.1
9	International power	UK	Yes	2	0	0.8	4	1	2.0	1.5
10	AEH Greece	Greece		0	1	0.6	DD	4	2.1	1.5
11	EDF group	France		0	1	0.6	DD	3	1.8	1.3
12	RWE	Germany	Yes	0	1	0.6	DD	3	1.8	1.3
13	Verbund	Austria	Yes	2	1	1.4	0	2	0.9	1.1
14	Enel	Italy		1	3	2.2	DD	DD	DD	0.9
15	British energy	UK		0	2	1.2	DD	1	0.6	0.8
16	EDP	Portugal		3	1	1.8	DD	DD	DD	0.7
17	EON	Germany	Yes	1	1	1.0	0	1	0.3	0.6
18	Fortum	Finland		2	1	1.4	DD	DD	DD	0.6
19	Vattenfall	Sweden	Yes	2	1	1.4	DD	DD	DD	0.6
20	ESB	Ireland		0	2	1.2	DD	DD	DD	0.5
21	Union Fenosa	Spain		1	1	1.0	DD	DD	DD	0.4

Eight companies out of twenty-one responded to the questionnaire. Five of these companies completed the questionnaire. RWE, Vattenfall and International Power did not complete the questionnaire. RWE has sent some documents and reports instead. Vattenfall indicated it was not willing to participate in the questionnaire, although in a preceding project they sent a complete overview of all production installations and annual production data. International Power has given some information.

Iberdrola is the best performing company in the scorecard for region 1, followed by ScottishPower and RAO-UES. Iberdrola and ScottishPower score especially high due to high grades for the Trend criterion. RAO-UES scores high due to a lot of

⁸ DD = Data Deficient

gas-CHP capacity in its fuel mix as well as in its planned capacity. Fortum and Vattenfall are the only companies in the table with the exact same grade: 0.56.

3.2 Region 2: United States and Canada

Figure 9 and Figure 10 show the total electricity supply in 2003 for companies bigger and smaller than 75 TWh, respectively. If 2003 data is not available, data for 2002 or the most recent year available is used. The underlying data for these graphs can be found in Table 20 in Appendix 5.2.

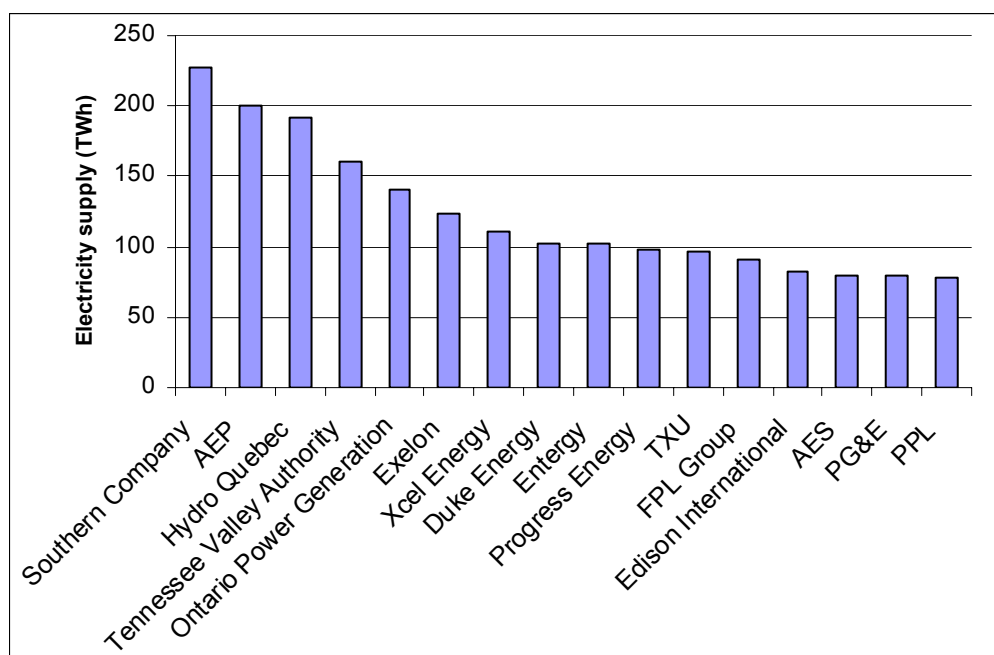


Figure 9 Electricity supply (TWh) in 2003/2002 for companies > 75 TWh

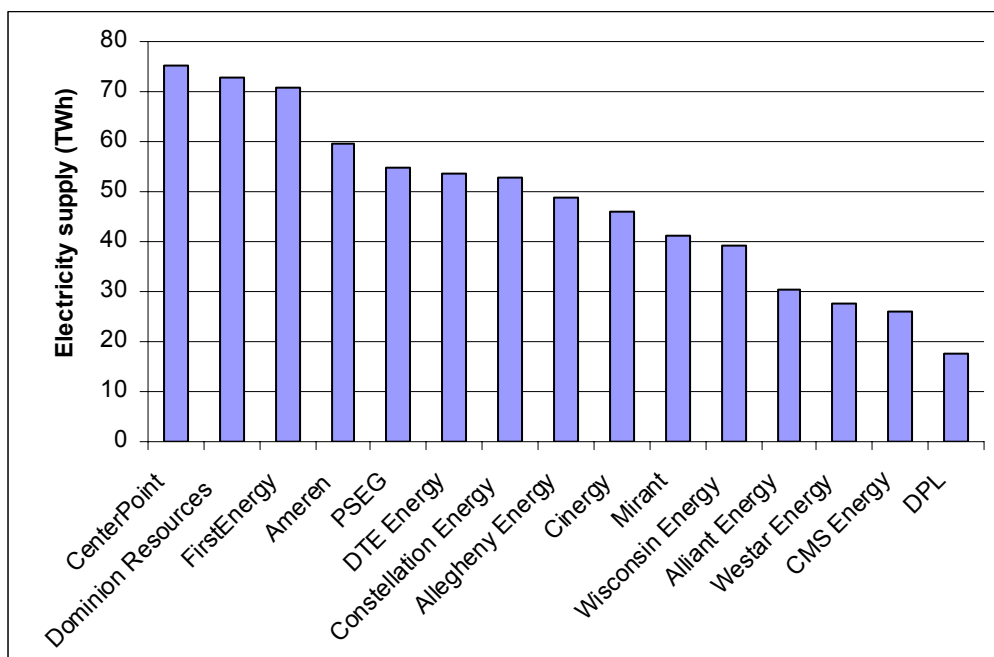


Figure 10 Electricity supply (TWh) in 2003/2002 for companies < 75 TWh

For a number of companies no data was available on supplied electricity. In this case the numbers in Figure 1 reflect produced electricity. This is valid for the companies: Allegheny Energy, Ameren, CMS Energy, Constellation Energy, DPL (Dayton Power and Light), Duke Energy, FirstEnergy, FPL Group, Mirant, PSEG, Southern Company, TXU, Westar Energy, Xcel Energy and Edison International.

Southern Company is the largest electricity producer in region 2: 228 TWh in 2002, followed by AEP and Hydro Quebec with respectively 200 and 192 TWh.

Figure 11 shows the fuel mix of supplied electricity in 2003/2002.

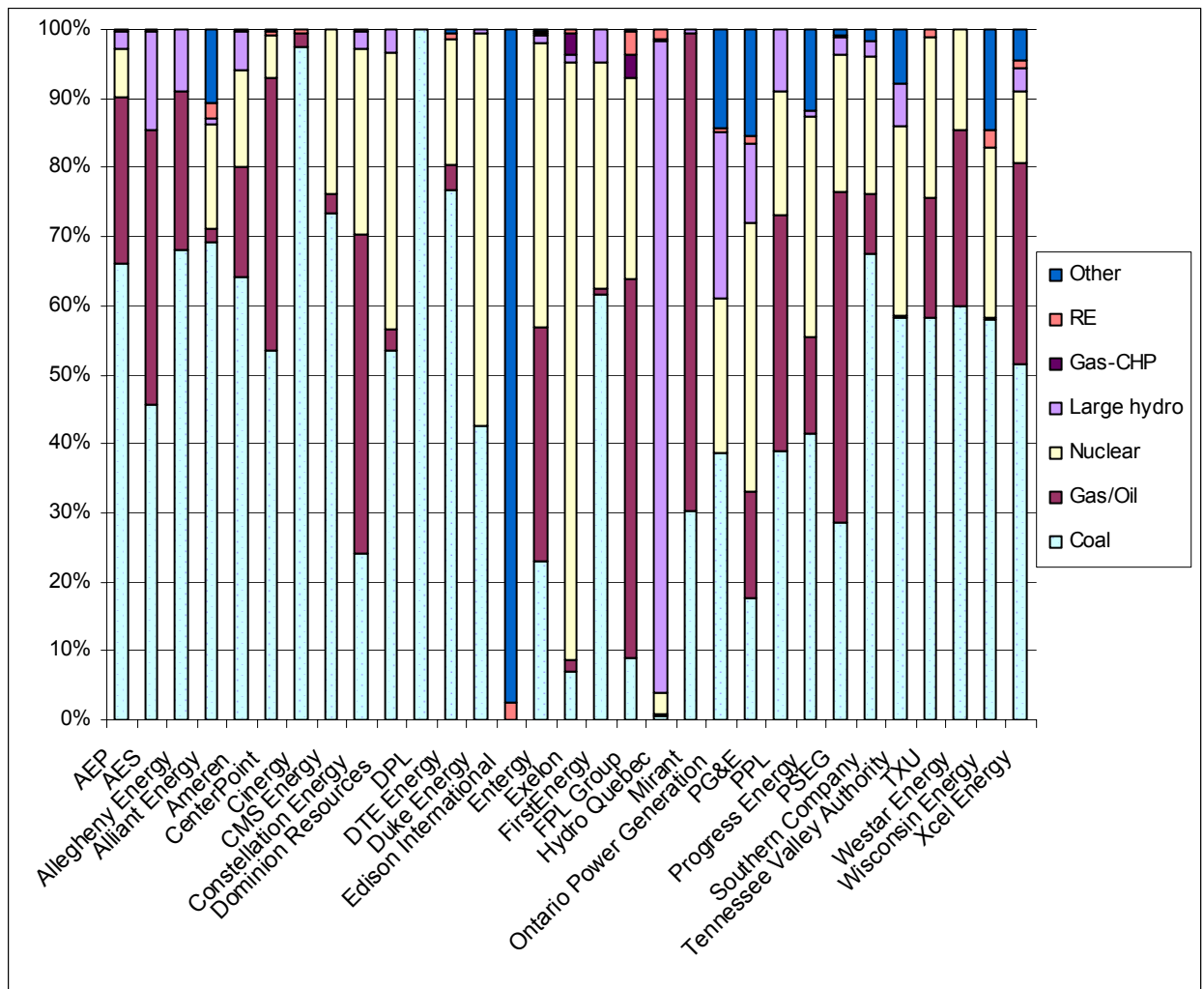


Figure 11 Fuel mix in 2002/2003

Figure 11 shows that US companies rely heavily on coal-fired power generation. Other important energy sources for electricity generation are natural gas and nuclear power. The fuel mix of the two Canadian companies shows large shares of hydro, coal and nuclear energy.

The fuel mix is based on supplied electricity for the companies: Alliant Energy, DTE Energy, PG&E, Progress Energy, Tennessee Valley Authority, Wisconsin Energy, Ontario Power Generation and Hydro Quebec. For the other companies the fuel mix is based on produced electricity. This applies as well to Figure 11 as to all figures in section 3.2.1.

3.2.1 Current situation

This section gives an overview of the Current situation for companies in region 2. Figure 12 and Figure 13 show the electricity generation from renewable energy and gas-CHP in 2003/2002.

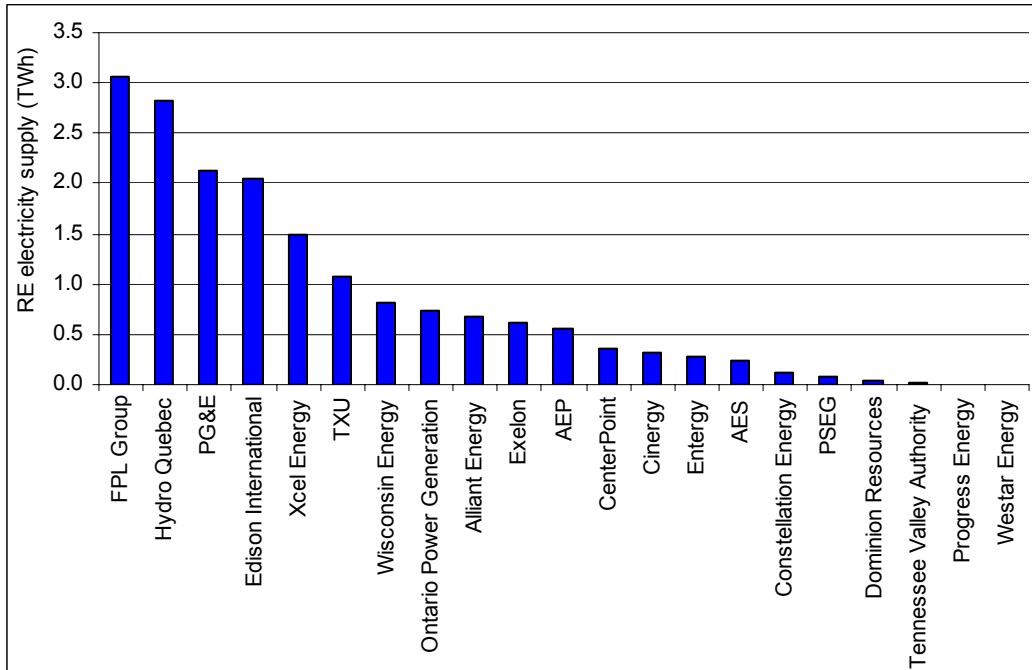


Figure 12 Electricity supply by RE (excl. large hydro) in 2002/2003

In absolute terms, Florida Power & Light Company (FPL) has the largest amount of renewable electricity production: 3.1 TWh in 2002 (mostly wind energy). Hydro Quebec and PG&E follow with respectively 2.8 and 2.1 TWh. For the companies not included in the figure the renewable electricity generation is zero or no data is available. There may be some double counting in Figure 12 since FPL sells part of their renewable electricity generation to other utilities.

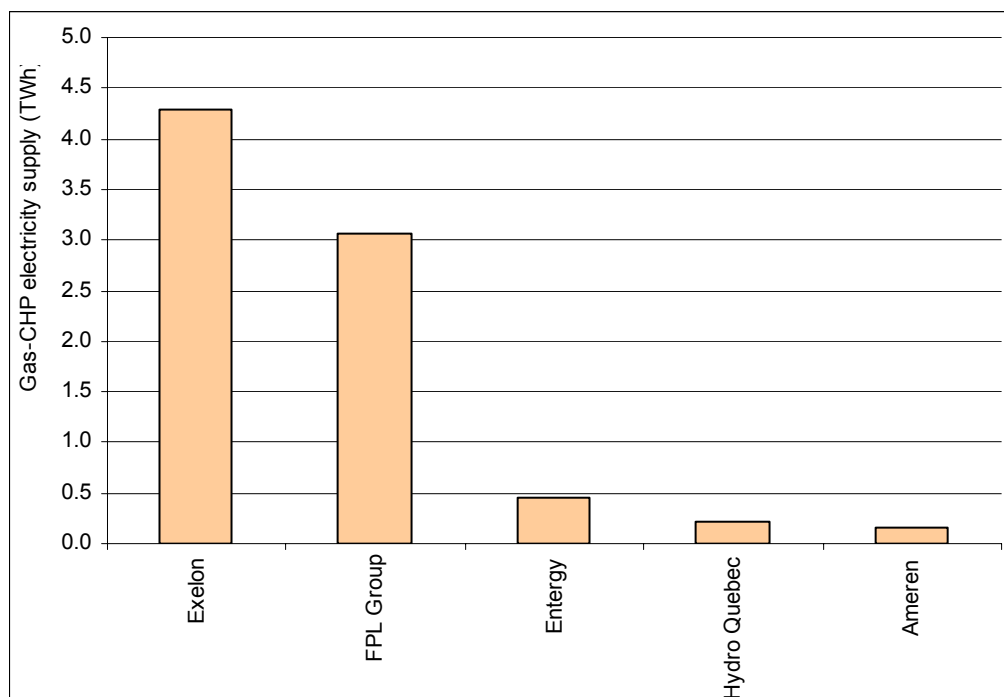


Figure 13 Electricity supply by gas-CHP in 2002/2003

Exelon and FPL have the largest amount of gas-CHP electricity production, respectively 4.3 and 3.1 TWh. For the companies not included in Figure 13, gas-CHP electricity generation is zero or no data is available. IEA statistics (IEA, 2003), suggest that electricity generated by gas-CHP in the US is 130 TWh in 2001. Gas-CHP in the US seems to be present mainly at smaller utilities, which are not included in this study. Examples are Calpine, Cogen Technology, Cogentrix Energy Inc and CoGen Funding (US DOE, 2004).

Figure 14 and Figure 15 show the share of renewable energy and gas-CHP in supplied electricity in 2003/2002.

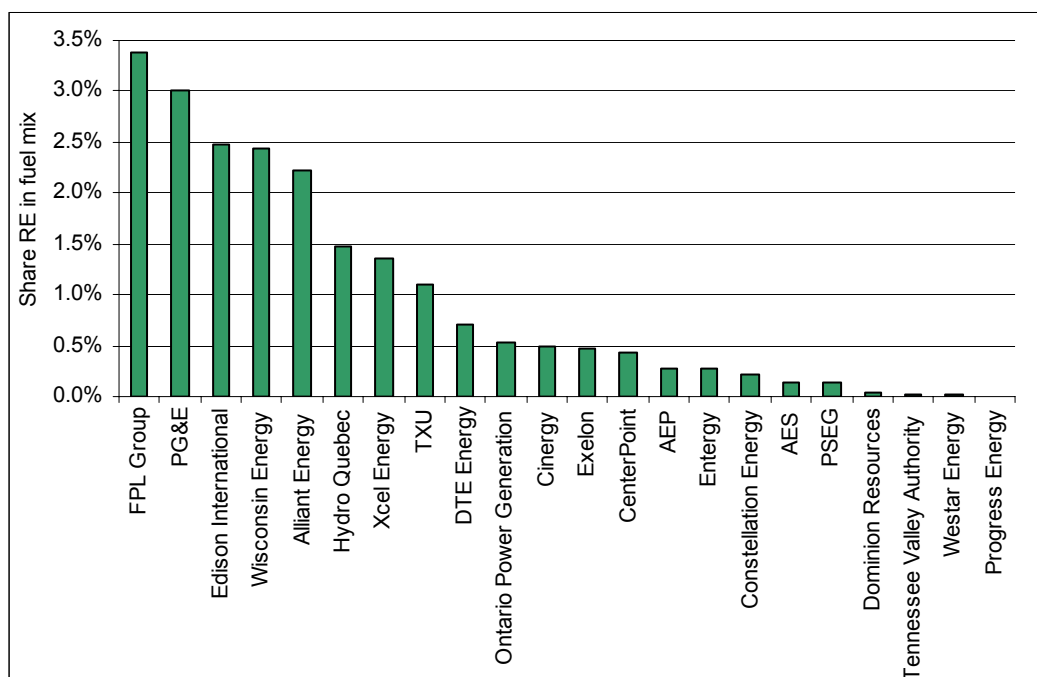


Figure 14 Share of RE (excl. large hydro) in fuel mix in 2002/2003

FPL has the largest share of renewable energy in their fuel mix: 3.4% in 2002.

PG&E and Edison International follow with respectively 3.0%⁹ and 2.5%. Note that in general the share of renewable energy in the fuel mix of the companies in region 2 is very low, only 8 companies out of 31 have shares above 1%.

⁹ According to PG&E's environmental report 2002, they have 1.4% wind energy, 1.6% geothermal energy, 3.3% hydro power (< 30 MW) and 4.3% biomass and waste. Since the threshold for small-scale hydro power in our study is 10 MW and we do not include waste, only their share of wind and geothermal energy could be included in this analysis. [http://www.pgecorp.com/corp_responsibility/pdf/env_rpt_02.pdf, page 27]

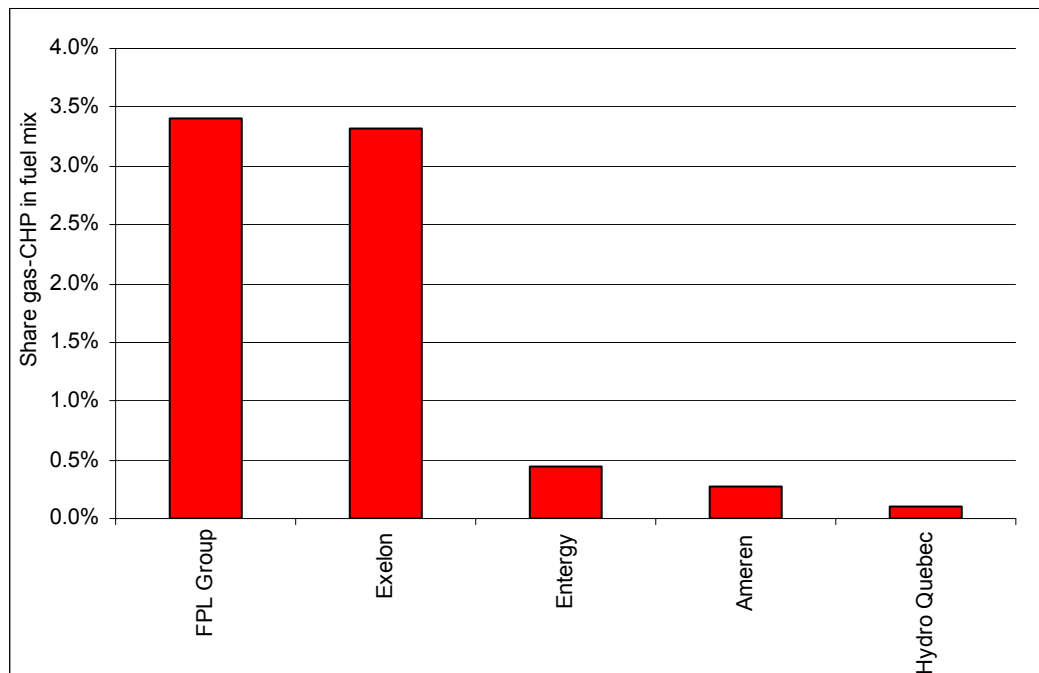


Figure 15 Share of gas-CHP in fuel mix in 2002/2003

Figure 15 shows that FPL and Exelon have in relative terms the largest share of gas-CHP in electricity supply: 3.4% and 3.3%, respectively.

3.2.2 Trend

This section gives an overview of the trend for companies in terms of renewable energy and gas-CHP use. The information in this section is not complete, because data regarding investments are very difficult to obtain and have large uncertainties. The companies AES, Southern Company, PSEG, TXU, Mirant, Dominion Resources, PG&E, Ameren, FirstEnergy, Allegheny Energy, Constellation Energy, PPL, DPL (Dayton Power and Light), Alliant Energy, Duke Energy, DTE Energy and Progress Energy are not included in the figures because no data on investments in renewable energy and gas-CHP were found in this study for these companies. The underlying data for the graphs can be found in Table 21 in Appendix 5.2.

Figure 16 and Figure 17 show the installed and planned capacity for companies respectively bigger and smaller than 20 GW. The figures distinguish between installed capacity before 1992, installed capacity installed after 1992 and planned capacity. The installed capacity after 1992 and the planned capacity are divided in renewable energy, gas-CHP and other capacity. ‘Other capacity’ means all capacity other than renewable energy and gas-CHP. Where the date of the commissioning of the installed capacity is not known, the term ‘Capacity date unknown’ is used. This means that it is not clear whether the capacity was installed before or after 1992.

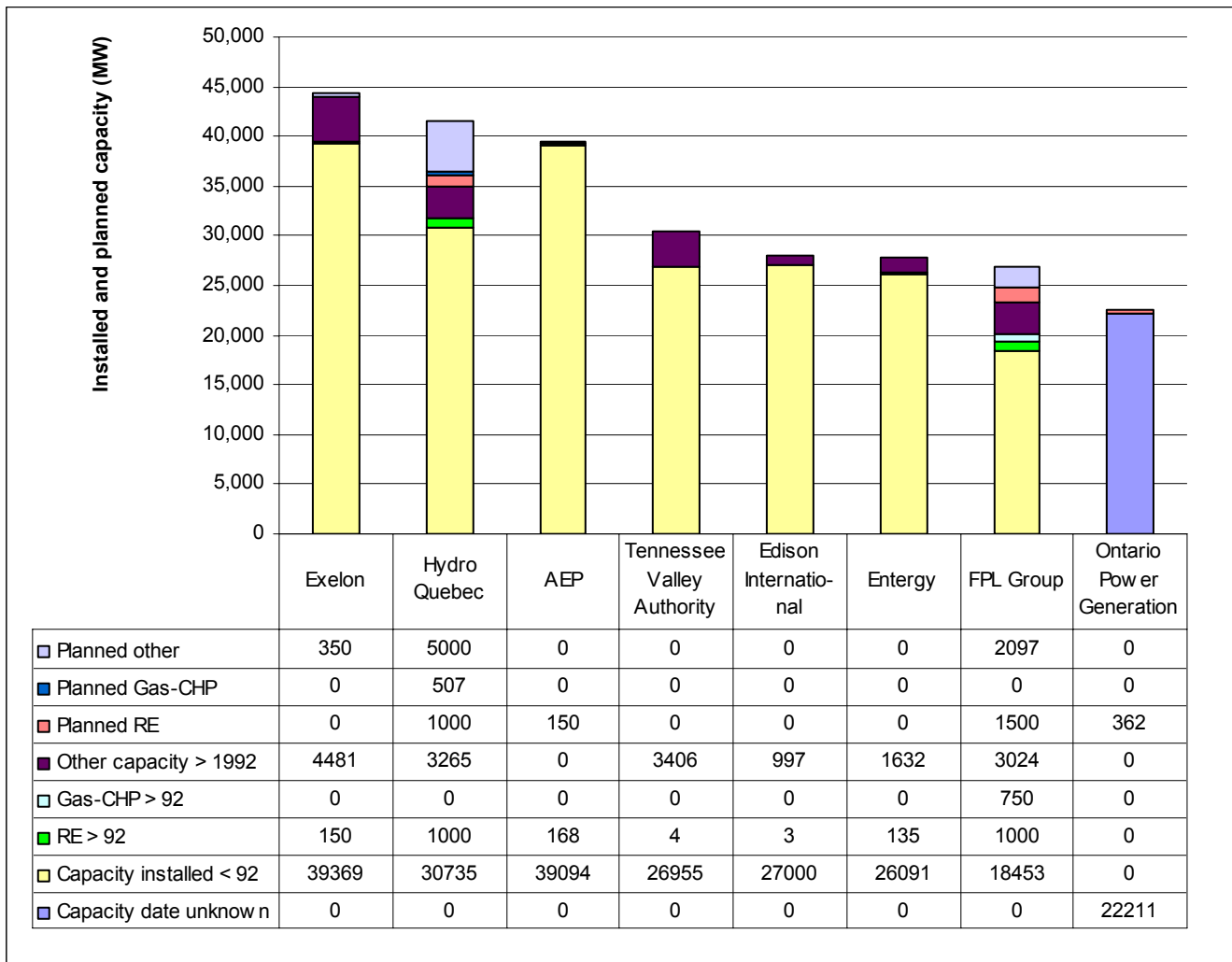


Figure 16 Installed and planned capacity (MW) for companies larger than 20 GW

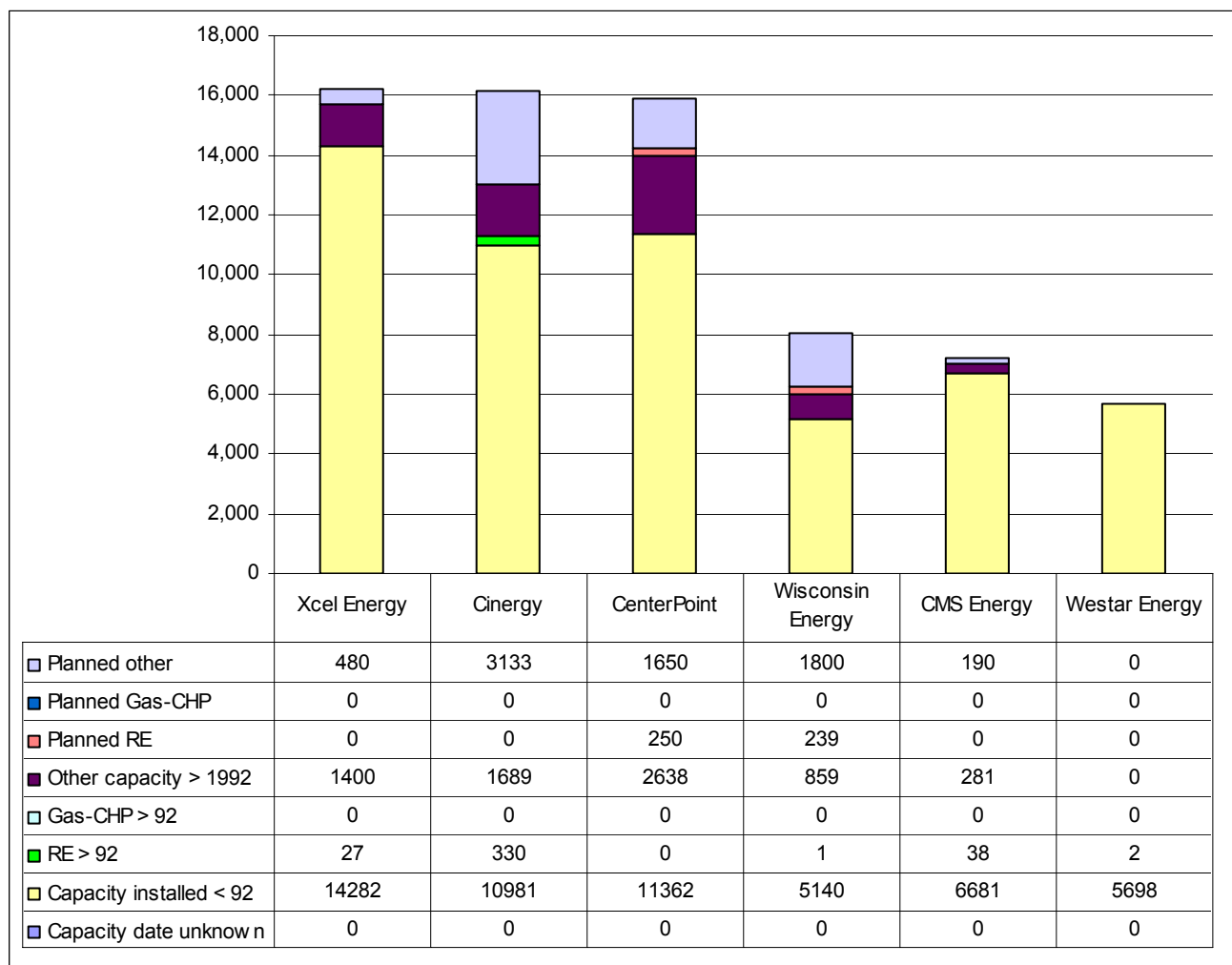


Figure 17 Installed and planned capacity (MW) for companies smaller than 20 GW

Hydro Quebec, FPL, Wisconsin Energy¹⁰, Cinergy and Centerpoint show significant amounts of renewable capacity in their investments. For gas-CHP, only Hydro Quebec and FPL show significant amounts in their investments.

Historic investments (1992-2004)

Table 8 shows the share of renewable energy and gas-CHP in investments in new capacity in the period 1992-2004 and the corresponding grades. The table is sorted by the grades for renewable energy. ‘Share in historic investments’ means the investments in RE and gas-CHP in comparison to total investments in the period 1992-2004. ‘Share in total capacity’ means the share of new RE and gas-CHP capacity in total installed capacity. The grades are based on the share of RE and gas-

¹⁰ Under legislation known as a Renewable Portfolio Standard Wisconsin utilities are required to increase gradually, over a 10-year period, renewable electricity supplies as a percentage of overall sales. From an initial level of 0.5% in 2001, the percentage rises to 2.2% in 2011. 17 states have passed a RPS. Thus, planned capacity for many companies is a result of RPS requirements, not progressive company initiatives.

CHP in total historic investments according to the grading system given in Table 3 in section 2.1.2. The grades for AEP and Westar Energy have been adjusted from 10 to respectively 4 and 2. The reason is that their installed new capacity in the period 1992-2004 is very small when compared to the company's total capacity, especially for Westar Energy (0.03% of total capacity).

Table 8 Share RE and gas-CHP in historic investments (1992-2004)

Company	Total capacity	New capacity > 1992 (MW)			Share in historic investments		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
FPL Group	23227	4774	1000	750	21%	16%	4%	3%	6	5
Hydro Quebec	35000	4265	1000	0	23%	0%	3%	0%	6	0
Cinergy	13000	2019	330	n.a.	16%	n.a.	3%	n.a.	5	0
CMS Energy	7000	319	38	n.a.	12%	n.a.	1%	n.a.	5	0
AEP	39262	168	168	n.a.	100%	n.a.	0%	n.a.	4	0
Entergy	27858	1767	135	n.a.	8%	n.a.	0%	n.a.	4	0
Exelon	44000	4631	150	n.a.	3%	n.a.	0%	n.a.	3	0
Xcel Energy	15710	1428	27	n.a.	2%	n.a.	0%	n.a.	2	0
Westar Energy	5700	2	2	n.a.	100%	n.a.	0%	n.a.	2	0
Tennessee Valley Authority	30365	3410	4	n.a.	0%	n.a.	0%	n.a.	1	0
Edison International	28000	1000	3	n.a.	0%	n.a.	0%	n.a.	1	0
Wisconsin Energy	6000	860	1	n.a.	0%	n.a.	0%	n.a.	1	0

Table 8 shows that FPL and Hydro-Quebec have the largest absolute amounts of new renewable energy capacity in the period 1992-2004, followed by Cinergy. For gas-CHP, FPL is the only company with new installed capacity for this period.

Planned investments

Table 9 shows the share of renewable energy and gas-CHP in planned capacity. The table is sorted by the grade for planned renewable energy capacity. 'Share in planned capacity' means the share of planned RE and gas-CHP in total planned capacity. 'Share in total capacity' means the amount of planned RE and gas-CHP divided by total installed capacity. The grades are based on the share of RE and gas-CHP in total planned capacity according to the grading system given in Table 3 in section 2.1.2.

Table 9 Share RE and gas-CHP in planned capacity

Companies	Total capacity	Planned capacity (MW)			Share in planned capacity		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
FPL Group	23227	3597	1500	n.a.	42%	n.a.	6%	n.a.	7	0
Hydro Quebec	35000	6507	1000	507	15%	8%	3%	1%	5	4
CenterPoint	14000	1900	250	0	13%	0%	2%	0%	5	0
Wisconsin Energy	6000	2039	239	n.a.	12%	n.a.	4%	n.a.	5	0
Ontario Power Generation	22211	n.a.	362	n.a.	n.a.	n.a.	2%	n.a.	1	0
AEP	39262	n.a.	150	n.a.	n.a.	n.a.	0%	n.a.	1	0

Companies with large amounts of planned renewable energy capacity are FPL and Hydro Quebec. For gas-CHP only Hydro Quebec was found to have plans for new capacity.

3.2.3 Future plans

In Table 10, the companies are divided into five categories. The table is based on environmental reports and reflects long-term plans of companies regarding renewable energy sources, energy-efficiency and carbon abatement. For a description of the categories see section 2.1.3. The table is sorted by category and by alphabet.

Table 10 Future plans of companies

	A (PowerSwitch! Pioneer)	B	C	D	E
FPL Group	X				
Hydro Quebec		X			
AEP			X		
Alliant Energy			X		
Cinergy			X		
CMS Energy			X		
Edison International			X		
Entergy			X		
Exelon			X		
Ontario Power Generation			X		
PG&E			X		
PSEG			X		
TXU			X		
Wisconsin Energy			X		
AES				X	
Allegheny Energy				X	
Ameren				X	
Constellation Energy				X	
Dominion Resources				X	
DTE Energy				X	
Duke Energy				X	
FirstEnergy				X	
Mirant				X	
PPL				X	
Progress Energy				X	
Southern Company				X	
Tennessee Valley Authority				X	
Xcel Energy				X	
CenterPoint					X
Dayton Power and Light (DPL)					X
Westar Energy					X

Explanation:

- A: WWF PowerSwitch! Pioneer.
- B: Ambitious targets for renewable energy.
- C: Moderate targets for renewable energy.
- D: No targets or plans for renewable energy.
- E: Little information available on environmental efforts.

3.2.4 Ranking

Table 11 shows the ranking of companies in region 2. The table is sorted on “Overall grade”. In case the overall grade for companies is equal, the companies are sorted alphabetically. The methodology for ranking can be found in chapter 2. The shading of the cells reflects the performance of companies. Cells with grades between 0 and 1 are shaded red and cells with values of 6 or higher are shaded green.

Table 11 Ranking of companies in region 2¹¹

	Companies	Country	Responded to Questionnaire	Current situation			Trend			Overall grade
				Gas-CHP	RE	Total	Gas-CHP	RE	Total	
1	FPL Group	US		3	3	3.0	3	7	4.9	4.1
2	Hydro Quebec	Canada	Yes	1	2	1.6	2	6	4.1	3.1
3	Wisconsin Energy	US		0	2	1.2	DD	3	1.8	1.6
4	Exelon	US		3	1	1.8	DD	2	0.9	1.3
5	AEP	US		0	1	0.6	0	3	1.5	1.1
6	CenterPoint	US		0	1	0.6	DD	3	1.5	1.1
7	Cinergy	US		0	1	0.6	DD	3	1.5	1.1
8	Entergy	US		1	1	1.0	DD	2	1.2	1.1
9	CMS Energy	US		0	0	0.0	DD	3	1.5	0.9
10	Xcel Energy	US		0	2	1.2	DD	1	0.6	0.8
11	PG&E	US		0	3	1.8	0	0	0.0	0.7
12	Edison International	US		0	2	1.2	DD	1	0.3	0.7
13	TXU	US		0	2	1.2	DD	1	0.3	0.7
14	Westar Energy	US		0	1	0.6	DD	1	0.6	0.6
15	Alliant Energy	US		0	2	1.2	DD	DD	DD	0.5
16	Ontario Power Generation	Canada		0	1	0.6	DD	1	0.3	0.4
17	Tennessee Valley Authority	US		0	1	0.6	DD	1	0.3	0.4
18	AES	US		0	1	0.6	DD	DD	DD	0.2
19	Constellation Energy	US		0	1	0.6	DD	DD	DD	0.2
20	Dominion Resources	US		0	1	0.6	DD	DD	DD	0.2
21	DTE Energy	US		0	1	0.6	DD	DD	DD	0.2
22	Progress Energy	US		0	1	0.6	DD	DD	DD	0.2
23	PSEG	US		0	1	0.6	DD	DD	DD	0.2
24	Ameren	US		1	0	0.4	DD	DD	DD	0.2
25	Allegheny Energy	US		0	0	0.0	DD	DD	DD	0.0
26	DPL	US		0	0	0.0	DD	DD	DD	0.0
27	Duke Energy	US		0	0	0.0	DD	DD	DD	0.0
28	FirstEnergy	US		0	0	0.0	DD	DD	DD	0.0
29	Mirant	US		0	0	0.0	DD	DD	DD	0.0
30	PPL	US		0	0	0.0	0	0	0.0	0.0
31	Southern Company	US		0	0	0.0	DD	DD	DD	0.0

The best performing company for region 2 is FPL, followed by Hydro Quebec and Wisconsin Energy. FPL performs best with respect to the Current situation as well as Trend. Hydro Quebec and Wisconsin Energy score especially well on the Trend criterion for renewable energy.

¹¹ DD = Data Deficient

Only one company out of thirty-one has responded to the questionnaire. Seven US companies have zero grades in the ranking and 75% of the companies score below 1.

Some companies have exactly the same grades. This applies to AEP, CenterPoint and Cinergy with a grade of 1.14. Edison International, TXU and Westar Energy have the same grade of 0.66. Ontario Power Generation and Tennessee Valley Authority both have an overall grade of 0.42. AES, Constellation Energy, Dominion Resources, DTE Energy, Progress Energy and PSEG have a grade of 0.24. Allegheny Energy, DPL (Dayton Power and Light), Duke Energy, FirstEnergy, Mirant, PPL and Southern Company all have a grade of 0.

3.3 Region 3: Japan and Australia

Figure 18 shows the electricity supply for the companies in region 3 for the year 2003. If 2003 data is not available, data for 2002 is used. The underlying data for this graph can be found in Table 23 in Appendix 5.3.

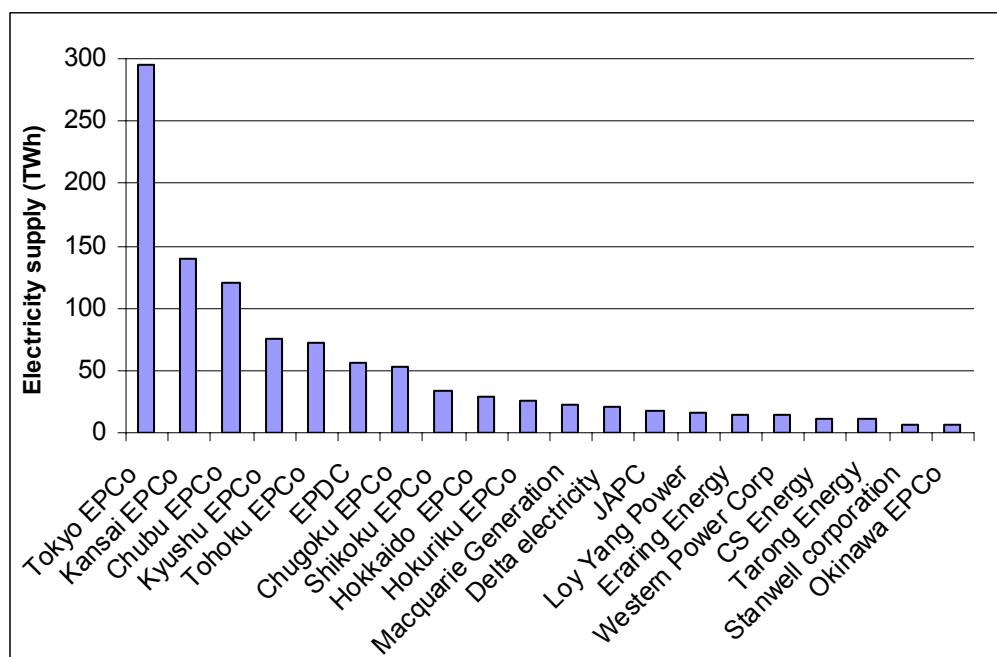


Figure 18 Electricity supply (TWh) in 2003/2002

Tokyo EPCo (Tepco) has by far the largest amount of electricity supply in region 3: 295 TWh in 2002. Kansai EPCo and Chubu EPCo follow by respectively 140 and 121 TWh.

For a number of companies no data was available on supplied electricity. In this case the numbers in Figure 18 reflect produced electricity. This is valid for the companies: JAPC, Macquarie Generation, Delta electricity, Eraring Energy, Loy Yang Power, Tarong Energy, Stanwell corporation and CS Energy.

Figure 19 shows the fuel mix of supplied electricity in 2003/2002.

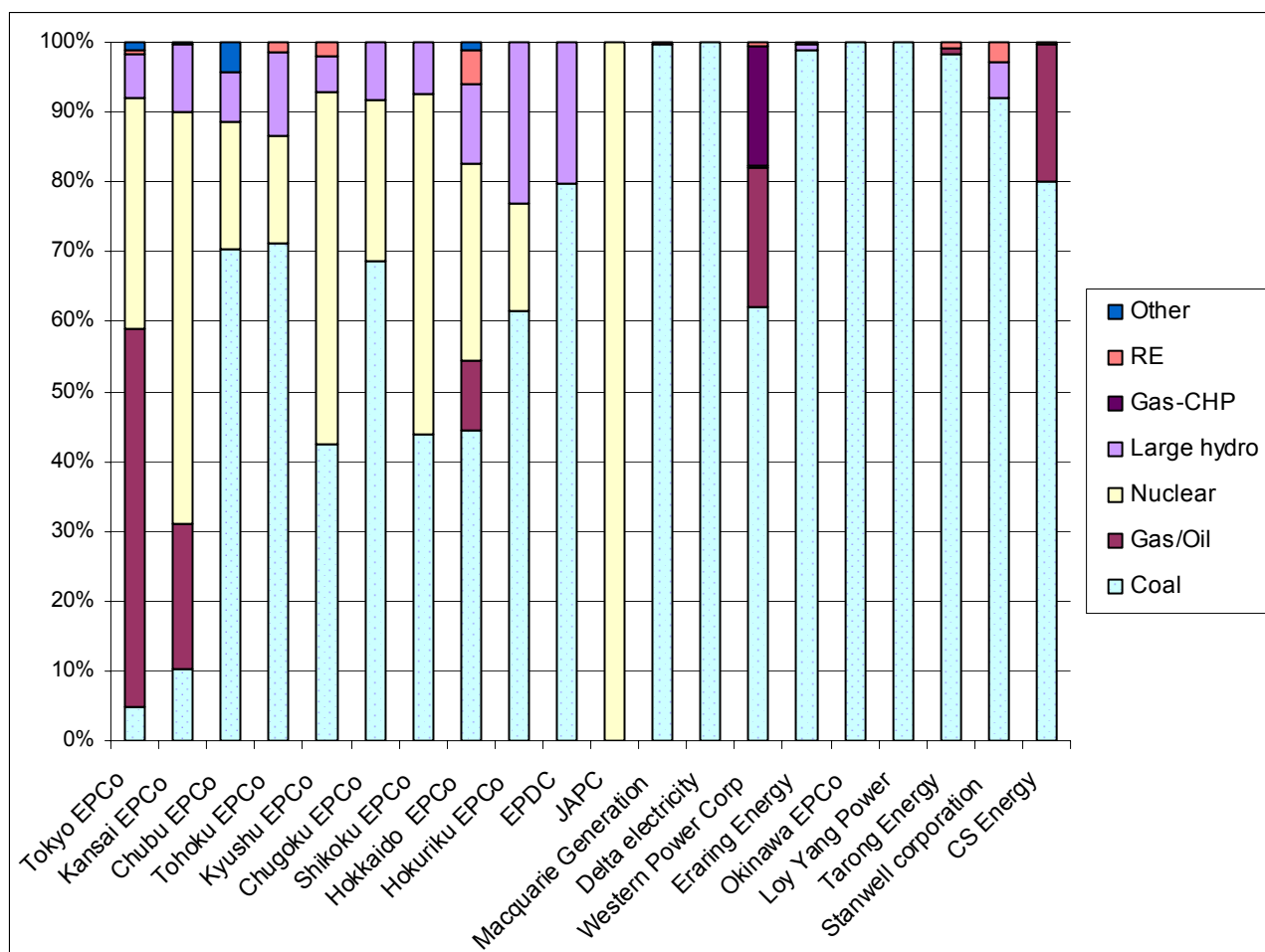


Figure 19 Fuel mix of supplied or produced electricity in 2002/2003

Figure 19 shows that coal is the most frequently used energy source for electricity production for the companies in region 3, followed by nuclear power and natural gas. Especially for the Australian companies the fuel mix is largely based on coal (often lignite).

The fuel mix is based on supplied electricity for the companies: Tokyo EPCo, Chubu EPCo, Kyushu EPCo, Hokuriku EPCo and Western Power Corp. For the other companies the fuel mix is based on produced electricity. This applies as well to Figure 19 as to all figures in section 3.3.1.

3.3.1 Current situation

This section gives an overview of the Current situation for companies in region 3. Figure 20 shows the absolute amount of electricity generation by renewable energy in 2003/2002.

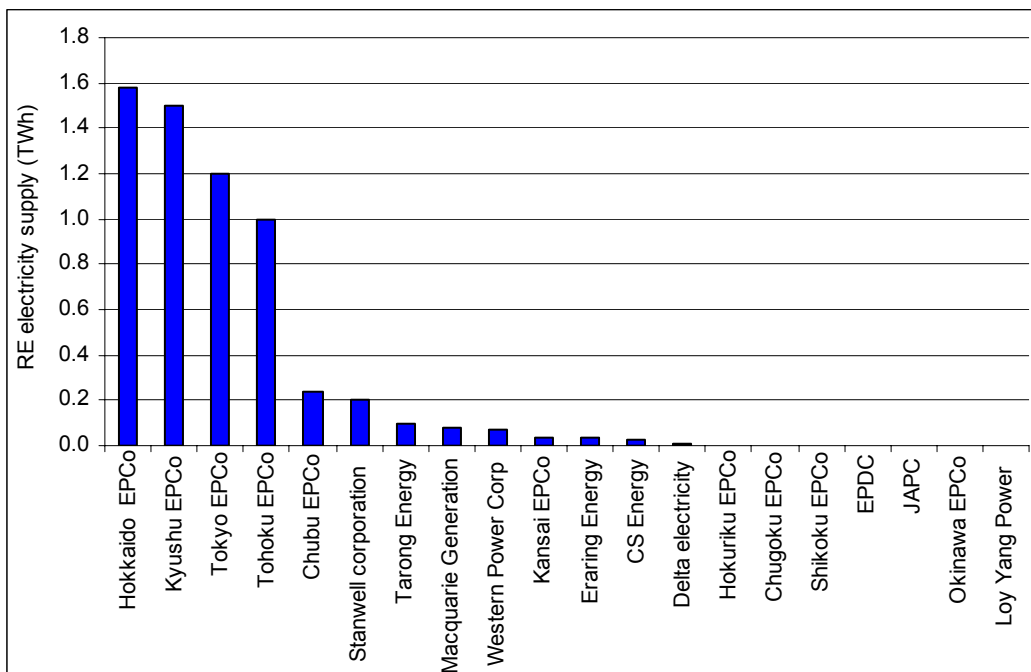


Figure 20 Electricity supply by RE (excl. large hydro) in 2002/2003

Figure 20 shows that electricity generation by renewable energy is limited in Japan and Australia. Hokkaido EPCo is leading in absolute terms with 1.6 TWh in 2002. Second is Kyushu EPCo with 1.5 TWh.

For most companies no data was found on gas-CHP. IEA (2003) statistics do not report any electricity production by public CHP plants in Japan or Australia in 2001. Western Power Corp was the only company that was found to use gas-CHP for its electricity supply: 2.4 TWh in 2003, which equals 17% of its electricity supply.

Figure 21 shows the share of renewable energy in supplied electricity in 2002/2003.

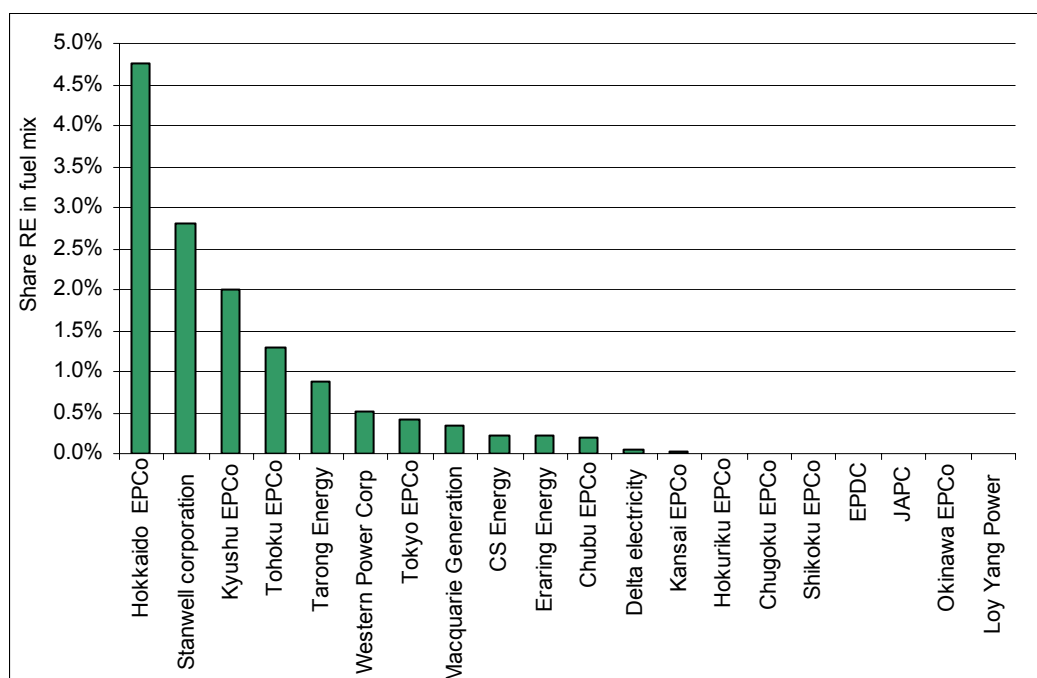


Figure 21 Share of RE (excl. large hydro) in fuel mix in 2002/2003

Figure 21 also shows that in relative terms Hokkaido EPCo leads in renewable electricity generation with a share of 4.8% in total electricity supply in 2002, followed by Stanwell corporation (2.8%) and Kyushu EPCo (2.0%). The share of renewable energy in the fuel mix is generally low for the companies in region 3. Only four companies out of twenty have shares above 1%.

3.3.2 Trend

This section gives an overview of the trend for companies in terms of renewable energy and gas-CHP use. The information in this section is not complete, because data regarding investments are very difficult to obtain. The companies EPDC, Chugoku EPCo, Hokuriku EPCo, Shikoku EPCo, JAPC, Loy Yang Power and Okinawa EPCo are not included in the figures because no data on investments in renewable energy and gas-CHP was found in this study. The underlying data for the graphs can be found in Table 24 in Appendix 5.3.

Figure 22 and Figure 23 show the installed and planned capacity for companies respectively bigger and smaller than 10 GW. The figures distinguish between installed capacity before 1992, installed capacity installed after 1992 and planned capacity. The installed capacity after 1992 and the planned capacity are divided in renewable energy, gas-CHP and other capacity. ‘Other capacity’ means all capacity other than renewable energy and gas-CHP. Where the date of the commissioning of

the installed capacity is not known, the term 'Capacity date unknown' is used. This means that it is not clear whether the capacity was installed before or after 1992.

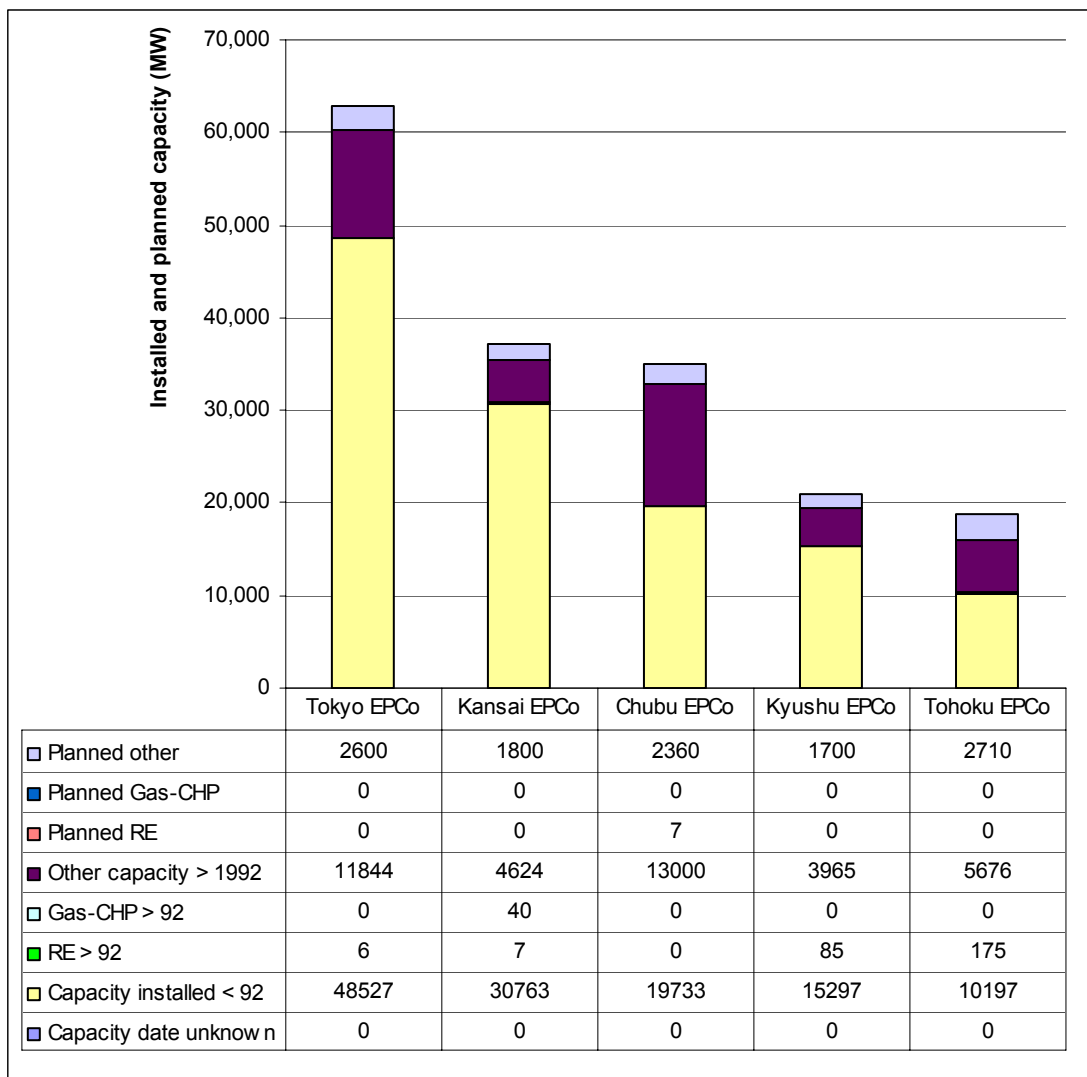


Figure 22 Installed and planned capacity (MW) for companies larger than 10 GW

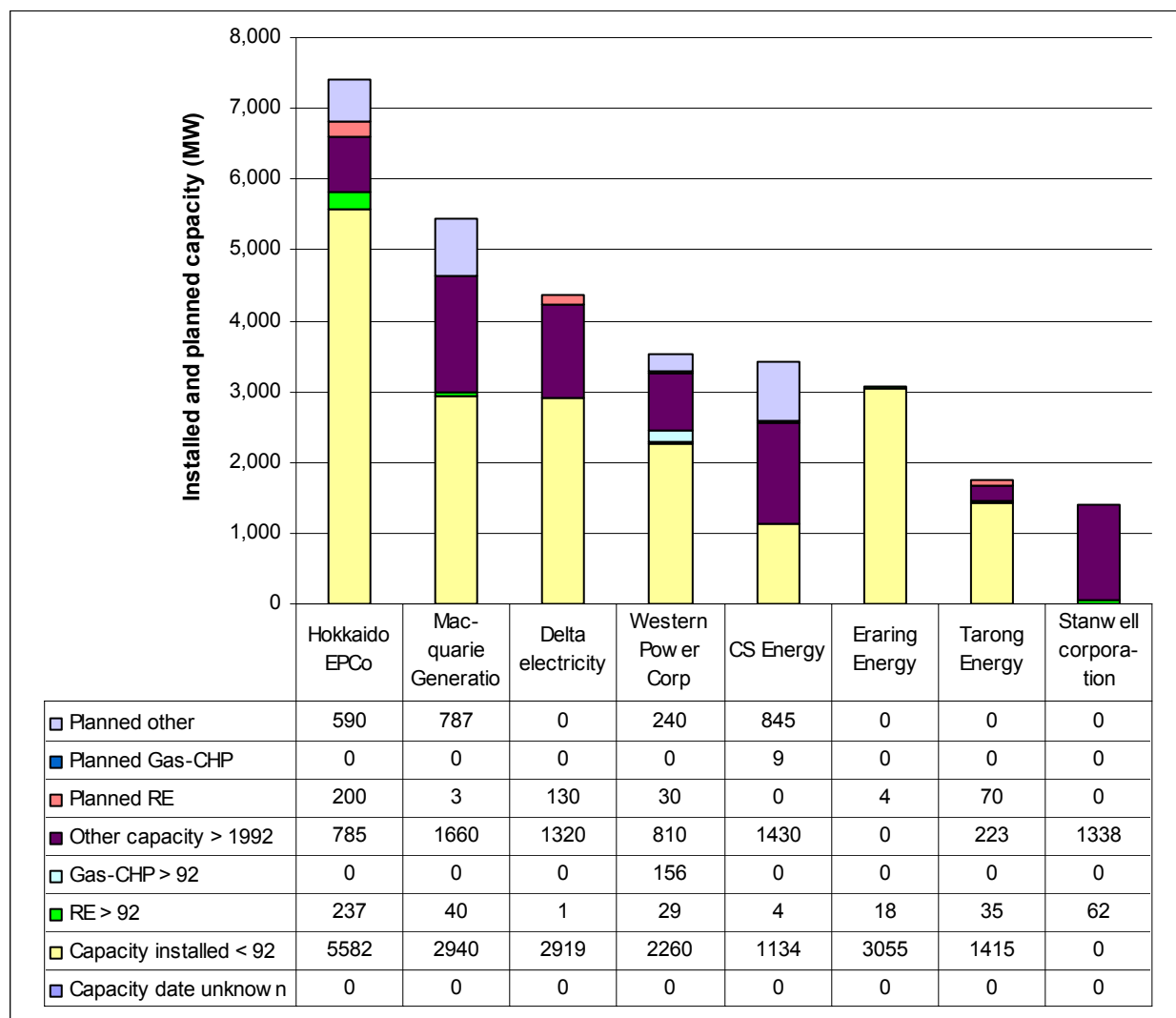


Figure 23 Installed and planned capacity for companies smaller than 10 GW

Hokkaido EPCo, Macquarie Generation, Delta electricity, Tarong Energy and Stanwell corporation show significant amounts of renewable capacity in their investments. For gas-CHP, only Western Power Corp shows a significant amount in their investments.

Historic investments (1992-2004)

Table 12 shows the share of renewable energy and gas-CHP in investments in new capacity in the period 1992-2004 and the corresponding grades. The table is sorted by the grades for renewable energy. ‘Share in historic investments’ means the investments in RE and gas-CHP in comparison to total investments in the period 1992-2004. ‘Share in total capacity’ means the share of new RE and gas-CHP capacity in total installed capacity. The grades are based on the share of RE and gas-CHP in total historic investments according to the grading system given in Table 3 in section 2.1.2. The grade for Eraring Energy has been adjusted from 10 to 4, be-

cause the installed new capacity in the period 1992-2004 is very small in comparison to total capacity (< 1%).

Table 12 Share RE and gas-CHP in historic investments (1992-2004)

Company	Total capacity	New capacity > 1992 (MW)			Share in historic investments		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
Hokkaido EPCo	6604	1022	237	n.a.	23%	n.a.	4%	n.a.	6	0
Tarong Energy	1672	257	35	0	13%	0%	2%	0%	5	0
Eraring Energy	3073	18	18	0	100%	0%	1%	0%	4	0
Stanwell corporation	1400	1400	62	0	4%	0%	4%	0%	3	0
Western Power Corp	3255	995	29	156	3%	16%	1%	5%	2	5
Tohoku EPCo	16048	5851	175	n.a.	3%	n.a.	1%	n.a.	2	0
Kyushu EPCo	19347	4050	85	n.a.	2%	n.a.	0%	n.a.	2	0
Macquarie Generation	4640	1700	40	n.a.	2%	n.a.	1%	n.a.	2	0
Kansai EPCo	35434	4671	7	40	0%	1%	0%	0%	1	1
Tokyo EPCo	60377	11850	6	n.a.	0%	n.a.	0%	n.a.	1	0
CS Energy	2568	1434	4	0	0%	0%	0%	0%	1	0
Delta electricity	4240	1321	1	n.a.	0%	n.a.	0%	n.a.	1	0

Table 12 shows that Hokkaido EPCo and Tohoku EPCo have the largest absolute amount of new renewable energy capacity in the period 1992-2004.

Planned investments

Table 13 shows the share of renewable energy and gas-CHP in planned capacity. The table is sorted by the grade for planned renewable energy capacity. ‘Share in planned capacity’ means the share of planned RE and gas-CHP in total planned capacity. ‘Share in total capacity’ means the amount of planned RE and gas-CHP divided by total installed capacity. The grades are based on the share of RE and gas-CHP in total planned capacity according to the grading system given in Table 3 in section 2.1.2. The grade for Eraring Energy has again been adjusted from 10 to 4, because the planned capacity is very small in comparison to total capacity (< 1%).

Table 13 Share RE and gas-CHP in planned capacity

Companies	Total capacity	Planned capacity (MW)			Share in planned capacity		Share in total capacity		Grades	
		Total	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP	RE	Gas-CHP
Delta electricity	4240	130	130	n.a.	100%	n.a.	3%	n.a.	10	0
Tarong Energy	1672	70	70	0	100%	0%	4%	0%	10	0
Hokkaido EPCo	6604	790	200	n.a.	25%	n.a.	3%	n.a.	6	0
Western Power Corp	3255	270	30	0	11%	0%	1%	0%	5	0
Eraring Energy	3073	4	4	0	100%	0%	0%	0%	4	0
Chubu EPCo	32733	2367	7	n.a.	0%	n.a.	0%	n.a.	1	0
Macquarie Generation	4640	790	3	0	0%	0%	0%	0%	1	0
CS Energy	2568	854	0	9	0%	1%	0%	0%	0	2

Table 13 shows that Hokkaido EPCo, Delta electricity and Tarong energy have the largest amounts of planned renewable energy capacity.

3.3.3 Future plans

In Table 14, the companies are divided into five categories. The table is based on environmental reports and reflects long-term plans of companies regarding renewable energy sources, energy-efficiency and carbon abatement. For a description of the categories see section 2.1.3. The table is sorted by category and by alphabet.

Table 14 Future plans of companies

	A (PowerSwitch! Pioneer)	B	C	D	E
Delta electricity		X			
Chubu EPCo			X		
CS Energy			X		
EPDC			X		
Eraring Energy			X		
Hokkaido EPCo			X		
Hokuriku EPCo			X		
Kyushu EPCo			X		
Macquarie Generation			X		
Stanwell corporation			X		
Tarong Energy			X		
Tohoku EPCo			X		
Tokyo EPCo			X		
Western Power Corp			X		
Chugoku EPCo				X	
JAPC				X	
Kansai EPCo				X	
Loy Yang Power				X	
Okinawa EPCo				X	
Shikoku EPCo				X	

Explanation:

- A: WWF PowerSwitch! Pioneer.
- B: Ambitious targets for renewable energy.
- C: Moderate targets for renewable energy.
- D: No targets or plans for renewable energy.
- E: Little information available on environmental efforts.

3.3.4 Ranking

Table 15 shows the ranking of companies in region 3. The table is sorted on “Overall grade”. In case the overall grade for companies is equal, the companies are sorted alphabetically. The methodology for ranking can be found in chapter 2. The shading of the cells reflects the performance of companies. Cells with grades 0 and 1 are shaded red and cells with values of 6 or higher are shaded green.

Table 15 Ranking of companies in region 3¹²

	Companies	Country	Responded to Questionnaire	Current situation			Trend			Overall grade
				Gas-CHP	RE	Total	Gas-CHP	RE	Total	
1	Tarong Energy	Australia	Yes	0	1	0.6	0	8	4.5	2.9
2	Western Power Corp	Australia	Yes	5	1	2.6	3	4	3.1	2.9
3	Hokkaido EPCo	Japan	Yes	0	3	1.8	0	6	3.6	2.9
4	Delta electricity	Australia	Yes	0	1	0.6	0	6	3.3	2.2
5	Eraring Energy	Australia	Yes	0	1	0.6	0	4	2.4	1.7
6	Stanwell corporation	Australia	Yes	0	2	1.2	0	2	0.9	1.0
7	Kyushu EPCo	Japan		0	2	1.2	DD	1	0.6	0.8
8	Tohoku EPCo	Japan		0	2	1.2	DD	1	0.6	0.8
9	Macquarie Generation	Australia	Yes	0	1	0.6	0	2	0.9	0.8
10	CS Energy	Australia	Yes	0	1	0.6	1	1	0.7	0.7
11	Kansai EPCo	Japan	Yes	0	1	0.6	1	1	0.5	0.5
12	Chubu EPCo	Japan		0	1	0.6	DD	1	0.3	0.4
13	Tokyo EPCo	Japan	Yes	0	1	0.6	0	1	0.3	0.4
14	Hokuriku EPCo	Japan		0	1	0.6	DD	DD	DD	0.2
15	Chugoku EPCo	Japan		0	0	0.0	DD	DD	DD	0.0
16	EPDC	Japan		0	0	0.0	DD	DD	DD	0.0
17	JAPC	Japan		0	0	0.0	DD	DD	DD	0.0
18	Loy Yang Power	Australia		0	0	0.0	DD	DD	DD	0.0
19	Okinawa EPCo	Japan		0	0	0.0	DD	DD	DD	0.0
20	Shikoku EPCo	Japan		0	0	0.0	DD	DD	DD	0.0

Ten companies out of twenty responded to the questionnaire. The best performing companies for region 3 are Tarong Energy, Western Power Corp and Hokkaido EPCo. The companies have overall grades of respectively 2.94, 2.90 and 2.88. Western Power Corp and Hokkaido EPCo perform well on the Current situation Criterion as well as on the Trend criterion. Tarong Energy performs well on the Trend criterion regarding renewable energy. Seventy percent of the companies in region 3 have overall grades below 1.

¹² DD = Data Deficient

Some companies have exactly the same grades. This applies to Kyushu EPCo and Tohoku EPCo with grades of 0.84, and Chubu EPCo and Tokyo EPCo with grades of 0.42. Chugoku EPCo, EPDC, JAPC, Loy Yang Power, Okinawa EPCo and Shikoku EPCo all have a grade of 0.

3.4 WWF PowerSwitch! Pioneers

In this section some details will be given of WWF PowerSwitch! Pioneer companies. These companies are power sector leaders in the field of sustainable development.

WWF is partnering with electric utilities and energy retailers across the world that take a leadership role in areas such as renewable energy, energy efficiency, a switch away from coal, and national policy. The retailers must have shown efforts in bringing their green product to as many consumers as possible in the market place. These companies are identified by WWF as 'PowerSwitch! Pioneers'. Many Pioneers are already on the way towards a CO₂-free power sector. Long term goals of the Pioneer companies differ per region, some examples are (1) no more investments into coal, (2) at least 20% renewable energy by 2020 and (3) extensive commitment to energy-efficiency and gas-CHP.

Three Power Pioneer companies are given below as an example.

1. Stadtwerke Hannover AG¹³ (Germany)

Stadtwerke Hannover is a traditional energy company. It has made a commitment to increase efficiency by 20% by 2007, and does not have plans for new coal power. The company supports the vision of its 75%-owned climate protection fund proKlima to reduce CO₂ emissions by 80% by 2050. The fund is part of a local alliance of regional governmental organisations (GO) and non-governmental organisations (NGO). In addition, Stadtwerke Hannover has a strong commitment to increase cogeneration of heat and power (which is a main means to achieve their efficiency goal), increase renewable energy and increase green power sales through active marketing for green power and fuel cell activities.

2. Electra Norte¹⁴ (Spain)

Electra Norte's commitment is that all electricity supplied to their clients is backed up by the production from a renewable source coming from their own power stations or of those of collaborating companies (Sistema Electra Norte). To verify this commitment, an external certifying company audits the procedures every year and emits a report certifying that they have produced at least as much renewable energy

¹³ Source:

http://www.panda.org/downloads/climate_change/powerswitchpioneers_oqud.doc

¹⁴ Source: <http://www.electranorte.es/english/compra.php>

as they have sold. For each new client, Electra Norte finances the plantation of a tree.

3. Austin Energy (US)¹⁵

Austin Energy, a municipal utility company in Texas, USA, serving more than 800,000 customers, has committed to generating 20 percent of the energy it sells from renewable resources by 2020. The company has a cutting edge “zero energy homes” program that will build affordable homes designed with the highest level of energy efficiency and enough photovoltaic solar power to provide all of the power needs. It also supports mandatory limits on carbon dioxide.

¹⁵ Source: <http://www.austinenergy.com/>

4 Conclusion & discussion

4.1 Data availability and uncertainty

Data availability was good for the Current situation criterion, but limited for the Trend criterion. Data was often incomplete and uncertain for historic investments and for the planned capacity.

The data availability in annual reports was sufficient to determine the fuel mix of most of the companies. However, the annual reports provide very limited and non-uniform data with respect to the fuel mix in investments, making it quite difficult to determine final scorings for the Trend criterion. The complex ownership and control structure of many (multi-national) utilities increases the non-transparency of available information.

As Trend weighs for 60% in the overall grading the uncertainty in the overall grades is high. However, this may induce companies to disclose information regarding their investments in order to gain a fairer place in the ranking.

The response to the questionnaire was good for region 3 (10 out of 20), moderate for region 1 (8 out of 21) and very poor for region 2 (1 out of 31).

4.2 Current situation

The best performing companies for the share of renewable energy in the overall fuel mix are Elkraft for region 1 (10.6%), FPL for region 2 (3.4%) and Hokkaido EPCo for region 3 (4.8%). For gas-CHP the best performing companies are RAO-UES for region 1 (53%), FPL for region 2 (3.4%) and Western Power Corp for region 3 (17%).

Nearly 65% of the European companies have shares of renewable energy in their fuel mix below 1%. Only 19% of the companies have shares larger than 2%. For regions 2 and 3 these numbers are even lower. For region 2 and 3 respectively 75% and 80% of the companies have shares below 1%. Respectively 16% and 10% have shares above 2%.

Data availability for gas-CHP is limited, especially for regions 2 and 3. For region 1 the share of gas-CHP in the fuel mix is at most 53%. For region 2 and 3 this is respectively 3.5% and 17%.

4.3 Trend

Although the data availability for the Trend criterion was very limited some conclusion will be drawn here. For region 1, Iberdrola, Endesa and ScottishPower have large amounts of planned renewable capacity: 2300, 2090 and 1300 MW respectively. For region 2, FPL and Hydro Quebec did well with 1500 and 1000 MW planned renewable capacity. In region 3 the best performing companies are Tarong and Hokkaido EPCo with 70 MW and 200 MW planned renewable capacity. For gas-CHP, RAO-UES, International Power and Hydro Quebec have large amounts of planned capacity: 18000, 644 and 507 MW respectively.

4.4 Scorecards

The best performing companies for region 1 are Iberdrola, ScottishPower and RAO-UES. Their grades are 4.3, 3.7 and 3.1 respectively. For region 2 the best performing companies are FPL, Hydro Quebec and Wisconsin Energy, with grades of 4.1, 3.1 and 1.6. The best performing companies for region 3 are Tarong Energy, Western Power Corp and Hokkaido EPCo. Their grades are all 2.9.

A number of companies have zero grades in the scorecards: 7 companies in region 2; 6 companies in region 3; and no companies in region 1. A grade of zero means that either no data is available or that these companies have no plans for renewable energy and gas-CHP. The lowest score in region 1 is 0.4 for Union Fenosa. Forty percent of the companies in region 1 have grades below 1. For region 2 this is 75% and for region 3, 70%.

5 Appendix

5.1 Data region 1: Western Europe

Table 16 Total electricity supply and production of companies in region 1

	Supply (TWh)	Production (TWh)	Installed capacity (MW)
RAO UES of Russia	636	636	156000
EDF group	n.a.	605	121135
RWE	544 ¹⁶	193 ¹⁷	35700
EON	251	156	34152
Enel	194	150	45700
Vattenfall	187	166	8770
Endesa	162	160	41836
Electrabel	n.a.	116	25714
ScottishPower	108	108	15400
Iberdrola	84	55	20304
Verbund	71	31	8890
EDP	70	53	11362
British energy	n.a.	68	11600
International Power	n.a.	49	11210
Essent	48	19	4042
AEH Greece	43	49	11739
Statkraft	n.a.	42	8961
Union Fenosa	n.a.	35	8511
Fortum	22	19	11329
ESB	n.a.	17	4347
Elkraft	13	0	5334

¹⁶ Worldwide electricity supply

¹⁷ In Germany

Table 17 Fuel mix of electricity companies in region 1

	Coal	Gas/Oil	Nuclear	Large hydro	Gas-CHP	RE	Other
Elkraft	38%	28%			19%	10.6%	4%
Enel	24%	53%	0%	20%	0%	4.0%	0%
Iberdrola	11%	16%	30%	38%	2%	3.5%	0%
Essent	42%	24%	9%	0%	22%	3.5%	0%
British energy	24%	28%	44%	0%	0%	2.0%	2%
Endesa	32%	15%	19%	22%	2%	1.9%	8%
ESB	33%	56%	0%	4%	0%	1.9%	5%
EDP	57%	3%	2%	28%	4%	0.9%	4%
Fortum	14%	0%	39%	28%	2%	0.9%	15%
EON	31%	5%	51%	11%	0%	0.7%	0%
ScottishPower	74%	10%	11%	5%	0%	0.6%	0%
Union Fenosa	46%	21%	16%	16%	0%	0.5%	
Statkraft	0%	0%	0%	100%	0%	0.5%	0%
RWE	69%	9%	19%	2%	0%	0.4%	0%
EDF group	17%	2%	72%	9%	0%	0.3%	0%
Vattenfall	39%	0%	37%	21%	1%	0.2%	0%
Electrabel	26%	21%	43%	2%	9%	0.1%	0%
Verbund	11%	0%		85%	2%	0.0%	0%
RAO UES of Russia	21%	3%	0%	18%	53%	0.0%	5%
AEH Greece	63%	27%	0%	8%	0%	0.0%	0%
International Power	44%	54%	0%	0%	2%	0.0%	0%

Table 18 Trend for region 1

Company	Total installed capacity	New capacity > 1992 (MW)			Planned capacity (MW)			Comments	Planned
		Total	RE	Gas-CHP	Total	RE	Gas-CHP		
Iberdrola	20304	3955	2084	271	6335	2300	58	Installed capacity other than RE and gas-CHP was CCGT	Planned capacity holds a large share of CCGT
EDF group	121135	230	230	n.a.	1600	n.a.	n.a.		Nuclear in 2012
EON	34152	n.a.	240	n.a.	n.a.	n.a.	n.a.		
Verbund	8890	n.a.	172	n.a.	10	10	n.a.	RE: since 1998	RE: +/-3000 MW, Total +/-5000 MW
RAO UES of Russia	156000	n.a.	40	n.a.	19110	110	18000		
Statkraft	8961	n.a.	40	n.a.	205	205	n.a.		
British energy	11600	2000	10	n.a.	n.a.	50	n.a.	British Energy purchased Eggborough in March 2000, a 2000 MW flexible coal fired plant. RE: Wind	RE: Offshore wind together with Renewable Energy Systems Limited (RES). 30 turbines of 2-3 MW.
AEH Greece	11739	980	35	n.a.	850	50	n.a.		RE: Applied projects till 2010. Only some projects have been approved by government. Geothermal & wind are the important resources.
EDP	11362	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Electrabel	25714	7061	20	1200	800	200	n.a.	Wind and coal	Wind: 160 MW under construction and 950 MW planned projects
Elkraft	5334	n.a.	n.a.	n.a.	26	26	n.a.		
Endesa	41836	n.a.	n.a.	n.a.	4890	2090	n.a.		Planned capacity includes 2800 MW CCGT
Enel	45700	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
ESB	4347	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Essent	4042	n.a.	n.a.	n.a.	785	40	135		
Fortum	11329	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
RWE	35700	n.a.	n.a.	n.a.	3950	1020	n.a.		Planned capacity includes lignite, hard coal, CCGT and gas
ScottishPower	15400	1125	181	544	2647	1313	n.a.	Period 2001-2004 only: Wind, CHP and CCGT	Wind and CCGT
Union Fenosa	8511	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Vattenfall	8770	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		Planned in 2003-2013: 26.2 TWh
International Power	11210	n.a.	n.a.	n.a.	1649	46	644		

5.2 Data region 2: US and Canada

Table 19 Total electricity supply and production of companies in region 2

	Supply (TWh)	Production (TWh)	Installed capacity (MW)
Southern Company	n.a.	228	36011
AEP	200	199	39262
Hydro Quebec	192	192	35000
Tennessee Valley Authority	160	152	30365
Ontario Power Generation	140	116	22211
Exelon	124	129	44000
Xcel Energy	n.a.	110	15710
Duke Energy	n.a.	102	19900
Entergy	102	101	27858
Progress Energy	99	87	23000
TXU	n.a.	97	18500
FPL Group	n.a.	90	23227
Edison International	n.a.	83	28000
AES	80	164	48130
PG&E	79	44	14688
PPL	79	47	11500
CenterPoint	75	83	14000
Dominion Resources	73	68	14000
FirstEnergy	n.a.	71	13387
Ameren	n.a.	60	14600
PSEG	n.a.	55	15853
DTE Energy	54	50	15000
Constellation Energy	n.a.	53	12000
Allegheny Energy	n.a.	49	11500
Cinergy	46	66	13000
Mirant	n.a.	41	18000
Wisconsin Energy	39	34	6000
Alliant Energy	30	27	5729
Westar Energy	n.a.	28	5700
CMS Energy	n.a.	26	7000
DPL	n.a.	18	6419

Table 20 Fuel mix of electricity companies

	Coal	Gas/Oil	Nuclear	Large hydro	Gas-CHP	RE	Other
FPL Group	9%	55%	29%	0%	3%	3.4%	0%
PG&E	21%	7%	24%	45%		3.0%	
Edison International					0%	2.5%	98%
Wisconsin Energy	58%	1%	25%	0%	0%	2.4%	15%
Alliant Energy	69%	2%	15%	1%	0%	2.2%	11%
Hydro Quebec	1%	0%	3%	94%	0%	1.5%	
Xcel Energy	52%	29%	11%	3%	0%	1.4%	4%
TXU	58%	17%	23%	0%	0%	1.1%	0%
DTE Energy	77%	4%	18%	0%	0%	0.7%	1%
Ontario Power Generation	39%	0%	22%	24%	0%	0.5%	14%
Cinergy	98%	2%	0%	0%	0%	0.5%	0%
Exelon	7%	2%	87%	1%	3%	0.5%	0%
CenterPoint	54%	39%	6%	0%	0%	0.4%	0%
AEP	65%	24%	7%	2%	0%	0.3%	
Entergy	23%	34%	41%	1%	0%	0.3%	0%
Constellation Energy	24%	46%	27%	2%	0%	0.2%	
AES	46%	39%		15%	0%	0.1%	
PSEG	29%	48%	20%	3%	0%	0.1%	1%
Dominion Resources	53%	3%	40%	3%	0%	0.0%	0%
Tennessee Valley Authority	58%	0%	27%	6%	0%	0.0%	8%
Westar Energy	60%	25%	14%	0%	0%	0.0%	
Progress Energy	41%	14%	32%	1%	0%	0.0%	12%
Allegheny Energy	68%	23%	0%	9%	0%	0.0%	
Ameren	64%	16%	14%	6%	0%	0.0%	0%
CMS Energy	75%	3%	24%		0%	0.0%	0%
DPL	100%	0%	0%	0%	0%	0.0%	0%
Duke Energy	43%	0%	57%	0%	0%	0.0%	0%
FirstEnergy	65%	1%	35%	5%	0%	0.0%	0%
Mirant	30%	69%	0%	1%	0%	0.0%	0%
PPL	39%	34%	18%	9%	0%	0.0%	0%
Southern Company	67%	9%	20%	2%	0%	0.0%	2%

Table 21 Trend region 2

Company	Total installed capacity	New capacity > 1992 (MW)			Planned capacity (MW)			Comments	Capacity > 92	Planned
		Total	RE	Gas-CHP	Total	RE	Gas-CHP			
AEP	39262	168	168	n.a.	n.a.	150	n.a.			
Westar Energy	5700	2	2	n.a.	n.a.	n.a.	n.a.			
Hydro Quebec	35000	4265	1000	0	6507	1000	507		5000 MW large-scale hydro, 1000 MW wind	
Cinergy	13000	2019	330	n.a.	3133	0	n.a.		NG	
CMS Energy	7000	319	38	n.a.	190	n.a.	n.a.			
Entergy	27858	1767	135	n.a.	n.a.	n.a.	n.a.			
Exelon	44000	4631	150	n.a.	350	n.a.	n.a.		Sithe NG (700 MW) Exelon owns 49.9% of Sithe	
Xcel Energy	15710	1428	27	n.a.	480	n.a.	n.a.		Oil	
Edison International	28000	1000	3	n.a.	n.a.	n.a.	n.a.	Brown coal		
Wisconsin Energy	6000	860	1	n.a.	2039	239	n.a.		214 MW Wind, 25 MW biomass and 1800 MW coal	
Tennessee Valley Authority	30365	3410	4	n.a.	n.a.	n.a.	n.a.			
FPL Group	23227	4774	1000	750	3597	1500	n.a.		NG and waste heat	
AES	48130	4961	0	n.a.	3750	0	n.a.		1200 MW in Spain, 700 MW (NG, partly CCGT) in the US, 230 MW CCGT in the UK, 339 MW coal in the UK, 454 MW CHP coal in Puerto Rico, 826 MW CCGT in Argentina	
Allegheny Energy	11500	2707	0	n.a.	1400	0	n.a.		NG (partly CCGT)	
Alliant Energy	5729	417	0	n.a.	n.a.	0	n.a.			
Ameren	14600	2117	0	n.a.	n.a.	n.a.	n.a.			
CenterPoint	14000	2638	0	n.a.	1900	250	0	NG partly CCGT	1320 MW CCGT, 550 MW coal, 235 MW wind and 15 MW landfill gas	
Constellation Energy	12000	192	0	n.a.	n.a.	n.a.	n.a.	NG partly CCGT		
Dominion Resources	14000	6773	0	n.a.	4000	n.a.	n.a.			
DPL	6419	1721	0	n.a.	n.a.	n.a.	n.a.			
DTE Energy	15000	764	0	n.a.	n.a.	n.a.	n.a.			
Duke Energy	19900	13848	0	n.a.	1600	0	n.a.		NG	
FirstEnergy	13387	1170	0	n.a.	0	0	n.a.			
Mirant	18000	3493	0	n.a.	450	0	n.a.		NG	
PG&E	14688	373	0	n.a.	n.a.	n.a.	n.a.			
PPL	11500	1440	0	n.a.	n.a.	n.a.	n.a.			
PSEG	15853	3055	0	n.a.	3000	n.a.	n.a.		Of which 2000 MW CCGT	
Southern Company	36011	5774	0	n.a.	9076	n.a.	n.a.		NG	
TXU	18500	1350	0	n.a.	n.a.	n.a.	n.a.			
Progress Energy	23000	10221	0	0	5468.3	0	0			
Ontario Power Generation	22211	n.a.	n.a.	n.a.	n.a.	362	n.a.			

5.3 Data region 3: Japan and Australia

Table 22 Total electricity supply and production of companies in region 3

	Supply (TWh)	Production (TWh)	Installed capacity (MW)
Tokyo EPCo	295	254	60377
Kansai EPCo	140	145	35434
Chubu EPCo	121	116	32733
Kyushu EPCo	75	73	19347
Tohoku EPCo	73	77	16048

	Supply (TWh)	Production (TWh)	Installed capacity (MW)
EPDC	n.a.	56	16085
Chugoku EPCo	54	45	12195
Shikoku EPCo	34	29	6893
Hokkaido EPCo	29	33	6604
Hokuriku EPCo	26	26	6759
Macquarie Generation	n.a.	23	4640
Delta electricity	n.a.	22	4240
JAPC	n.a.	18	2617
Loy Yang Power	n.a.	16	2000
Eraring Energy	n.a.	15	3073
Western Power Corp	14	14	3255
CS Energy	n.a.	12	2568
Tarong Energy	n.a.	11	1672
Stanwell corporation	n.a.	7	1400
Okinawa EPCo	7	6	1676

Table 23 Fuel mix of electricity companies region 3: Japan and Australia

	Coal	Gas/Oil	Nuclear	Large hydro	Gas-CHP	RE	Other
Hokkaido EPCo	44%	10%	28%	11%	0%	4.8%	1%
Stanwell corporation	92%	0%	0%	5%	0%	2.8%	
Kyushu EPCo	41%		49%	5%	0%	2.0%	
Tohoku EPCo	72%		15%	12%	0%	1.3%	
Tarong Energy	99%	1%				0.9%	
Western Power Corp	62%	20%	0%	0%	17%	0.5%	
Tokyo EPCo	5%	54%	33%	6%	0%	0.4%	1%
Macquarie Generator	100%				0%	0.3%	
CS Energy	80%	20%	0%	0%	0%	0.2%	
Eraring Energy	99%			1%	0%	0.2%	
Chubu EPCo	70%	0%	18%	7%	0%	0.2%	4%
Delta electricity	100%				0%	0.1%	
Kansai EPCo	10%	21%	59%	9%	0%	0.0%	0%
Hokuriku EPCo	62%		15%	23%	0%	0.0%	
Chugoku EPCo	69%		23%	8%	0%	0.0%	
Shikoku EPCo	44%		49%	7%	0%	0.0%	
EPDC	80%		0%	20%	0%	0.0%	
JAPC	0%		100%	0%	0%	0.0%	
Okinawa EPCo	100%				0%	0.0%	
Loy Yang Power	100%				0%	0.0%	

Table 24 Trend region 3

	Total installed capacity	New capacity > 1992 (MW)			Planned capacity (MW)			Comments	Planned
		Total	RE	Gas-CHP	Total	RE	Gas-CHP		
Tokyo EPCo	60377	11850	6	n.a.	2600	0		5680 MW CCGT, 1126 MW NG ST and GT and 4900 MW nuclear	2600 MW coal
Kansai EPCo	35434	4671	7	40	1800	n.a.	n.a.	1340 MW CCGT	1800 MW coal in 2010
Chubu EPCo	32733	13000	0	n.a.	2367	7	n.a.		1000 MW oil in 2013 and 1380 MW nuclear in 2005
Kyushu EPCo	19347	4050	85	n.a.	1700	n.a.	n.a.	1605 MW CCGT and 2360 MW nuclear. RE: geothermal.	Coal
EPDC	16085	n.a.	n.a.	n.a.	2400	n.a.	n.a.		
Tohoku EPCo	16048	5851	175	n.a.	2710	n.a.	n.a.	1650 MW nuclear, rest fossil. RE: geothermal power.	1610 MW CCGT in 2006 and 1100 MW nuclear in 2005
Chugoku EPCo	12195	n.a.	n.a.	n.a.	500	n.a.	n.a.		Coal
Shikoku EPCo	6893	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Hokuriku EPCo	6759	n.a.	n.a.	n.a.	1358	n.a.	n.a.		Nuclear
Hokkaido EPCo	6604	1022	237	n.a.	790	200	n.a.	785 MW coal in '98 and '02	700 MW pumped storage in 2007
Macquarie Generation	4640	1700	40	n.a.	790	3	0	Coal. RE: 0.7 MW hydro and biomass cofiring 309 GWh.	CCGT
Delta electricity	4240	1321	1	n.a.	130	130	n.a.	Coal 1993	
Western Power Corp	3255	995	29	156	270	30	0	330 MW coal in 1999	240 MW CCGT
Eraring Energy	3073	18	18	0	4	4	0		Hydro power
JAPC	2617	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
CS Energy	2568	1434	4	0	854	0	9	450 MW supercritical coal in 2001. 710 MW CCGT 1997-2002.	
Loy Yang Power	2000	0	0	0	n.a.	0	0		
Okinawa EPCo	1676	n.a.	n.a.	n.a.	220	n.a.	n.a.		Coal
Tarong Energy	1672	257	35	0	70	70	0	Coal in 2003	Wind power
Stanwell corporation	1400	1400	62	0	0	0	0	Coal in 1993 and 1996	Many projects in feasibility

5.4 Included companies

Table 25 Included companies in Scorecards

	Company	Country
Western Europe and Russia	AEH Greece	Greece
	British energy	UK
	EDF group	France
	EDP	Portugal
	Electrabel	Belgium
	Elkraft	Denmark
	Endesa	Spain
	Enel	Italy
	EON	Germany
	ESB	Ireland
	Essent	Netherlands
	Fortum	Finland
	Iberdrola	Spain
	International Power	UK
	RAO UES of Russia	Russia
	RWE	Germany
	ScottishPower	UK
	Statkraft	Norway
	Union Fenosa	Spain
	Vattenfall	Sweden
Verbund	Austria	
US and Canada	AES	US
	AEP	US
	Allegheny Energy	US
	Alliant Energy	US
	Ameren	US
	CenterPoint	US
	Cinergy	US
	CMS Energy	US
	Constellation Energy	US
	Dominion Resources	US
	DPL (Dayton Power and Light)	US
	DTE Energy	US
	Duke Energy	US
	Edison International	US
	Entergy	US
	Exelon	US

	Company	Country
	FirstEnergy	US
	FPL Group	US
	Mirant	US
	PG&E	US
	PPL	US
	Progress Energy	US
	PSEG	US
	Southern Company	US
	Tennessee Valley Authority	US
	TXU	US
	Westar Energy	US
	Wisconsin Energy	US
	Xcel Energy	US
	Hydro Quebec	Canada
	Ontario Power Generation	Canada
Japan and Australia	Chubu EPCo	Japan
	Chugoku EPCo	Japan
	EPDC	Japan
	Hokkaido EPCo	Japan
	Hokuriku EPCo	Japan
	JAPC	Japan
	Kansai EPCo	Japan
	Kyushu EPCo	Japan
	Okinawa EPCo	Japan
	Shikoku EPCo	Japan
	Tohoku EPCo	Japan
	Tokyo EPCo	Japan
	CS Energy	Australia
	Delta electricity	Australia
	Eraring Energy	Australia
	Loy Yang Power	Australia
	Macquarie Generation	Australia
	Stanwell corporation	Australia
	Tarong Energy	Australia
	Western Power Corp	Australia

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AEH

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British energy

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<http://www.british-energy.com/environment/framesets/renewables.html>

EDF

<http://www.edf.com/>

Sustainability report: 25 March 2004

EDP

http://www.edp.pt/index.asp?LID=EN&MID=2&OID=6000000&PID=0&CID=106217&Fich=MenuLateralID2_EN&SESSID=u34O02O21h00e02N4C7e4Fq

Electrabel

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Elkraft

<http://eng.elkraft-system.dk/>

Endesa

http://www.endesa.com/english/documentacion/memoria2002/Annual_Report_2002_ENDESA.pdf

Enel

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EON

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ESB

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Essent

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Fortum

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ScottishPower

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Statkraft

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Union Fenosa

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Vattenfall

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Verbund

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AEP

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For determining future plans: <http://www.pressi.com/int/release/58543.html>

AES

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Allegheny Energy

<http://www.alleghenypower.com/ourenvironment.asp>

Alliant Energy

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Ameren

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CenterPoint

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Cinergy

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www.cms.com

Constellation Energy

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<http://www.centerpointenergy.com/investors/financial/1,2776,100301,00.html>

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<http://www.constellationenergy.com/about/climate.asp>

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Dominion Resources

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DPL (Dayton Power and Light)

<http://www.dplinc.com/>

DTE Energy

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For determining future plans:

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Duke Energy

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Edison International

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http://www.edison.com/media/indiv_pr.asp?bu=&year=0&id=4402

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Entergy

<http://www.energy.com/Investor/Financial/annual.asp>

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FirstEnergy

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PG&E

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PPL

<http://www.pplweb.com/>

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Progress Energy

<http://www.progress-energy.com/aboutenergy/powerplants/index.asp>

<http://www.progress-energy.com/environment/report/ear.pdf>

PSEG

<http://www.pseg.com/companies/global/portfolio.html>

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Southern Company

www.southerncompany.com

Tennessee Valley Authority (TVA)

<http://www.tva.gov/environment/reports/aer2002update/index.htm>

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TXU

<http://www.txucorp.com/investres/SEC/default.asp>

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Westar Energy

http://www.wstnres.com/corp_com/contentmgt.nsf/publishedpages/our%20energy

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Wisconsin Energy

<http://www.we-energies.com/company/wewgkeyfacts.htm>

<http://www.wec-performancereport.com/>

For determining future plans:

<http://www.wec-performancereport.com/environmental/index.htm>

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Australia:

CS Energy

www.csenergy.com.au

Delta electricity

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Eraring Energy

<http://www.eraring-energy.com.au/>

Loy Yang Power

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Macquarie Generation

http://www.macgen.com.au/about_us/Comm_Report04/Community_Report04.pdf
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Stanwell corporation

www.stanwell.com

Tarong Energy

www.tarongenergy.com.au

Western Power Corp

http://www.wpcorp.com.au/html/about_us/company_profile/annual_reports/index.html

Japan:

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<http://www.jepic.or.jp/english/jdata/pdf/electr2003.pdf>, data for March 31, 2002

Chubu

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Hokuriku

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Kyushu

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Tohoku

<http://www.jepic.or.jp/english/jdata/pdf/electr2003.pdf>, data for March 31, 2002

<http://www.tohoku-epco.co.jp/enviro/list-e.htm>

Tokyo EPCO (Tepco)

<http://www.jepic.or.jp/english/jdata/pdf/electr2003.pdf>, data for March 31, 2002

<http://www.tepco.co.jp/index-e.html>

5.6 Letter Questionnaire

Dear Madam, Sir,

The World Wide Fund for Nature WWF, known as World Wildlife Fund in USA and Canada has started the Power Switch! campaign aiming at achieving a low-carbon electricity supply worldwide (please see <http://www.panda.org>). Part of this campaign is the assessment of performance of large OECD power companies and utilities to switch towards a sustainable energy supply.

WWF has asked Ecofys to gather the required information for determining individual company performances by means of this questionnaire and from publicly available information, such as annual (environmental) reports and company websites. The result of this research will be documented publicly via ranking or Score Cards.

The attached annex to this letter explains the methodology. Moreover, a set of indicators is included for which we ask you to provide the correct information.

We hope that you will contribute to this initiative to determine a correct and fair position of your company. If you cannot answer (part of) the questions or don't intend to return the questionnaire, could you please indicate your reasons for this? We would like to point out that the methodology provides a higher ranking for public reporting of information and will thus result in a lower ranking for non response.

Yours sincerely,

Monique Voogt
Ecofys Netherlands
Manager Energy and Climate Strategies

Dr. Stephan Singer
WWF European Policy Office
Head of Climate Change Unit

5.7 Questionnaire WWF

The methodology to determine performance of individual companies consists of two parts. The first part deals with your current fuel mix of energy supply. We ask you to identify your share of new renewable electricity¹⁸, electricity from gas-fired combined heat and power generation and other sources of electricity in TWh/GWh or MWh – rather than in capacity. The second part deals with the investments in new renewable energy and gas-fired CHP capacity compared to investments in other new capacity, particularly coal.

We would like to gather information for the whole company. That is, the holding company and all its daughter companies. We ask you to provide ownership-based information and NOT control-based information. For example: when your company owns 40% of the shares of a certain electricity company, please include 40% of its sales/generation/capacity as part of your overall performance data.

Part 1: Fuel mix of current supply

The basis for fuel mix calculations is the supply of electricity from all companies belonging to your company. If supply-based information is not available, we ask you to provide production-based information (and if that is not available, capacity-based information) and indicate this in the following box. We ask you to provide the most recent information available and indicate the year.

Basis of calculation of fuel mix:

- Supply-based information
- Production-based information
- Capacity-based information

Data from (year):

¹⁸ *New renewable electricity*: shall mean all renewable non-fossil and non-nuclear energy sources (wind, solar, geothermal, wave, tidal, small scale hydropower below 10 MW capacity, sustainable biomass, landfill gas, sewage treatment plant gas and biogases); Electricity from large-scale hydro power (over 10 MW capacity), peat, and waste incineration is excluded.

	GWh	% of total
Coal		
Gas		
Oil		
Nuclear		
Large-scale hydro power (> 10 MW)		
Gas-fired CHP electricity		
New Renewable electricity		
Other sources		
Total		

Does your company publish the fuel mix of electricity supplies (production, capacity, for instance in an annual report or on the electricity bills)?

- Yes; fuel mix is published
 No; fuel mix is not published

If so, please indicate what fuel mix is published (supply, production, capacity) and where it is published.

Does an independent third party verify the published figures?

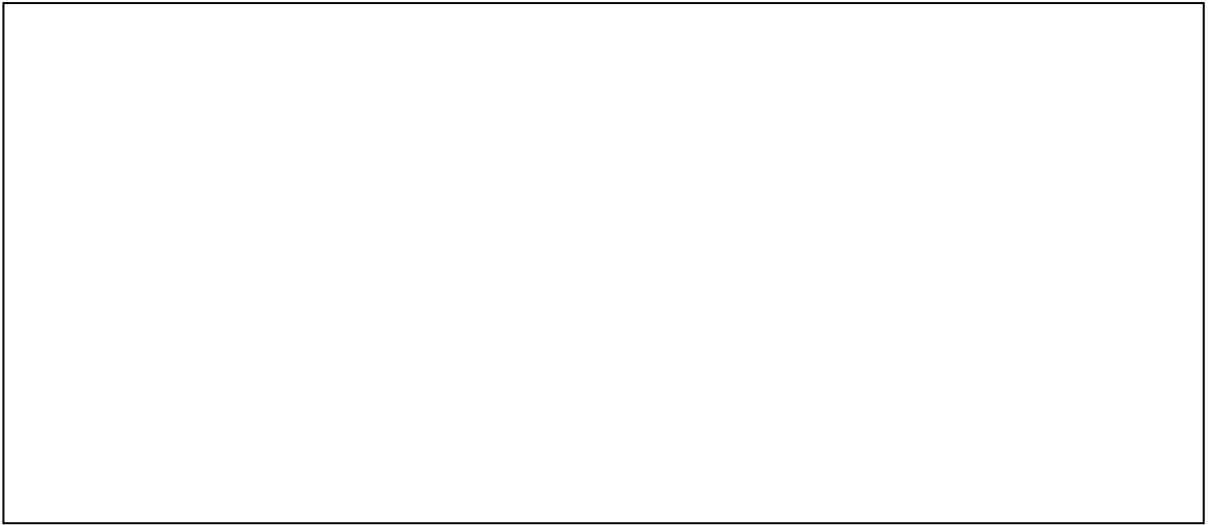
- Yes; fuel mix is verified by an independent third party
 No; fuel mix is not verified by an independent third party

Part 2: Investments in new renewable electricity supplies

In the second part we will determine the investments in new renewable energy and gas-fired CHP capacity compared to investments in other new capacity. We would like to ask you to provide information on historic investments and investments planned for the coming years (2003-2005) and new capacity being commissioned in 2004. For the historic investments, please provide data when possible since 1992; otherwise please indicate from what year on you can report these investments.

<i>(data in MWe capacity and million Euro or dollar)</i>	New renewable capacity	New gas-fired CHP capacity	New total capacity
Historic investments			
Capacity commissioned since 1992 (or indicate alternative base year) (MWe)			
Total capacity commissioned since 1992 (MWe)			
Investments since 1992 (million Euro or dollar)			
Future investments			
Capacity (planned to be) commissioned in 2003 - 2005			
Planned capacity beyond 2005 (MWe)			
Investments 2003 - 2005 (million Euro or dollar)			
Investments beyond 2005 (million Euro or dollar)			

Comments and suggestions to the methodology as well as other relevant information that illustrate your company's efforts to switching towards a sustainable energy supply are welcomed in the text box below. In case part of your large-scale hydropower supplies (generation/capacity) is certified under qualifications meeting the requirements of the World Commission on Dams, please indicate this as well. Also you can indicate here your reasons for not filling in the questionnaire.



Thank you for your co-operation.

5.8 List of abbreviations

Abbreviation	Explanation
n.a.	Not Available
CCGT	Combine Cycle Gas Turbine
DSM	Demand Side Management
DD	Data Deficient
Gas-CHP	Natural Gas-fired Combined Heat and Power
GT	Gas Turbine
NG	Natural Gas
RE	Renewable Energy
ST	Steam Turbine

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption



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