Oxford Economic Research Associates

Department of Trade and Industry

Energy Market Competition in Europe and G7

Appendices

September 2004

Blue Boar Court
Alfred Street
Oxford OX1 4EH
Tel: +44 (0) 1865 253000
Fax: +44 (0) 1865 251172
Email: Enquiries@OXERA.co.uk
www.OXERA.co.uk

Contents

Appendix 1: Data Used for Indicator Evaluation, Final 2002 Dataset

A1.1 Data availability, final 2002 dataset

Electricity

Information missing	Austria	Finland	Italy	Spain	Sweden	UK
Upstream market						
Market share of generators	Info n/a for second largest	Yes	Yes	Yes	Yes	Yes
Degree of technical openness of market	Yes	Yes	Yes	Yes	Yes	Yes
Openness of allocation mechanism to import capacity	Yes	Yes	Yes	Yes	Yes	Yes
Wholesale market						
Share of total volume traded covered by price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Standardised contracts in wholesale markets	Yes	Yes	Yes	Yes	Yes	Yes
Downstream market						
Degree of supply market opening	Yes	Yes	Yes	Yes	Yes	
Market share of largest suppliers	Yes	Yes	Yes	Yes	Yes	Incomplete data due to commercial confidentiality
Switching rates	Yes	Info n/a	Yes	Yes	Yes	Yes
Network-related activities						
Unbundling at transmission level	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at transmission level	Yes	Yes	Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at distribution level	Info n/a	Info n/a	Info n/a	Info n/a	Info n/a	Yes

Gas

Information missing	Austria	Finland	Italy	Spain	Sweden	UK
Upstream market data						
Market share of shippers	Info n/a for second and third largest shippers		Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Yes	Info n/a for second and third largest shippers
Wholesale market data						
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Share of total volume traded covered by price reporting	Yes		Yes	Yes	Yes	Yes
Standardised contracts in wholesale markets	Yes		Yes	Yes	Yes	Yes
Downstream market data						
Degree of supply market opening	Yes	Yes	Yes	Yes	Yes	Yes
Market share of suppliers	Info n/a for third largest		Info n/a for third largest	Yes	Yes	Incomplete info
Switching rates	Yes		Yes	Yes	Info n/a for domestic market	Yes
Network-related activities						
Unbundling at transmission level	Yes		Yes	Yes	Yes	Yes
rTPA at transmission level	Yes	Yes	Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes		Yes	Yes	Yes	Yes
rTPA at distribution level	Yes		Yes	Yes	Yes	Yes
Competitive access to gas storage	Info n/a	Info n/a	Info n/a	Info n/a	Info n/a	Info n/a

A1.2 Detailed data, final 2002 dataset

Austrian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.33	ES2003, p.60, Table 1.2	
two largest generators	"	0.39	Assumed	Linear solution applied
three largest generators	"	0.45	EC2002, p.4, Table 1	
Degree of technical openness of market	Total interconnector capacity as % of peak demand	0.45	EC2002, p.27, Table 11	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y	Energy Exchange Austria	
Share of total (daily) volume traded covered by price reporting		0.5	"	
Standardised contracts		Y	2	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.14	Bundeslastverteiler	
two largest suppliers	"	0.33	"	
three largest suppliers	"	0.53	"	
Switching	% of eligible customers' gross switching per annum	0.15	EC2003, p.9, Table 4	

Sources (for this and subsequent tables): EC2002, European Commission (2003), 'Second Benchmarking Report on the Implementation of the Internal Electricity and Gas Market', April; EC2003, European Commission (2004), 'Third Benchmarking Report on the Implementation of the Internal Electricity and Gas Market', March; ES2002, Eurostat (2002), 'Competition Indicators in the Electricity Market: EU and Norway', Data 1999–2000; ES2003, Eurostat (2003), 'Competition Indicators in the Electricity Market: EU , Norway and candidate countries', Data 1999–2001.

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.14	Bundeslastverteiler	
two largest suppliers	"	0.33	"	
three largest suppliers	"	0.53	"	
Switching	% of eligible customers' gross switching	0.05	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, Report, p.4, Table 1	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, Report, p.11, Table 5	(Regulated)
Unbundling at distribution level	Legal or ownership separation	N	EC2002, Report, p.4, Table 1	(Accounting)
rTPA at distribution level		Y	E-control	

Austrian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.80	EC2002, p.22, Table 9	
two largest shippers	"	0.85	Assumed, based on EC2002, p.22	Shows no. of companies with at least 5% of available gas share
three largest shippers	"	0.90	Assumed, based on EC2002, p.22	"
Wholesale market				
Price reporting	Price information publicly available	Y	ESGM	A gas hub exists at Baumgarten with limited liquidity
Share of total (daily) volume traded covered by price reporting	–	0.20	Assumed	Volumes included in gas release programme
Standardised contracts	–	Y	ESGM	Standardised contract terms can be obtained at the Baumgarten hub
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.9	'Report for the European Commission Directorate-General for Transport and Energy to determine changes after opening of the gas market in August 2000' and the IEA	The OMV Group is the main company involved in the supply, transmission and storage of Austrian natural gas. It supplies 90% of gas used in Austria through both its imports and domestic production. Ruhrgas comes second, with about 6%. (2001 data)
two largest suppliers	"	0.96	"	
three largest suppliers	"	0.98	Assumed	
Switching	% of eligible customers' gross switching	0.06	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2.	
Market share of				
largest supplier	% of total supply/consumption	0.9	'Report for the European Commission Directorate-General for Transport and Energy to determine changes after opening of the gas market in August 2000' and the IEA	The OMV Group is the main company involved in the supply, transmission and storage of Austrian natural gas. It supplies 90% of gas used in Austria through both its imports and domestic production. Ruhrgas comes second, with about 6%. (2001 data)
two largest suppliers	"	0.96	"	
three largest suppliers	"	0.98	Assumed	
Switching	% of eligible customers' gross switching	0	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.6, Table 2	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC 2002, Table 2, p.6	
Unbundling at distribution level	Legal or ownership separation	N	EC2002, p.6, Table 2	(Legal)
rTPA at distribution level		Y	EC 2002, Table 2, p.6	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	Assumed, Based on EC2002, p.71, Table 2	

Finnish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.26	ES2003, p.67, Table 1.2	
two largest generators	"	0.36	ES2003, p.67, Table 1.2	
three largest generators	"	0.44	ES2003, p.67, Table 1.2	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.24	Assumed, based on paper by Energy Research Centre of the Netherlands (In 2000, Finland had 22% import capacity); and EC2003 (in 2003 Finland has 25% import capacity). Assumption of 24% made in 2002	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		rTPA, allocation method: market splitting. Allocation frequency: daily
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting	–	1	"	
Standardised contracts	–	Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.12	ES2003, p.69, Table 3.2	
two largest suppliers	"	0.23	ES2003, p.69, Table 3.2	
three largest suppliers	"	0.29	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.15	Assumed	No data entered for Finland in EC2003, p.9, Table 4. Assumed same as other best-performing countries (ie, 15%). Note that 2001 data entry of 7.5%

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.12	ES2003, p.69, Table 3.2	
two largest suppliers	"	0.23	ES2003, p.69, Table 3.2	
three largest suppliers	"	0.29	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.10	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, Report, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, Report, p.11, Table 5	(Regulation)
Unbundling at distribution level	Legal or ownership separation	N	EC2002, Report, p.4, Table 1	(Management)
rTPA at distribution level		Y	Assumed	

Finnish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total gas sources by shipper	1		Derogation for monopoly market
two largest generator	"	1		"
three largest generator	"	1		"
Wholesale market				
Price reporting	Price information publicly available		www.energimarkkinavirasto.fi/select.asp?gid=118&languageud	
Share of total (daily) volume traded covered by price reporting		0	Assumed	
Standardised contracts		N	Assumed	
Downstream market				
I&C				Because of the derogation and 0% market opening, the competitiveness indicators on market opening and customer switching are 0
Degree of supply market opening	% of total customer base in volume terms	0		
Market share of				
largest supplier	% of total supply/consumption	1		Because of the derogation and 0% market opening, share of supplier/s =100%
two largest suppliers	"	1		
three largest suppliers	"	1		
Switching	% of eligible customers' gross switching	0		
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0		
Market share of				
largest supplier	% of total supply/consumption	1		
two largest suppliers	"	1		
three largest suppliers	"	1		
Switching		0		

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	N		
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y		
Unbundling at distribution level	Legal or ownership separation	N		
rTPA at distribution level		N		
Competitive access to gas storage		N		

Italian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.51	ES2003, p.51, Table 1.2	
two largest generators	"	0.61	ES2003, p.51, Table 1.2	
three largest generators	"	0.69	ES2003, p.51, Table 1.2	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.12	EC2002, p.27, Table 11	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	N		Italian wholesale market not established
Share of total (daily) volume traded covered by price reporting		0		"
Standardised contracts		N		"
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	0.70	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.60	ES2003, p.52, Table 3.2	
two largest suppliers	"	0.68	ES2003, p.52, Table 3.2	
three largest suppliers	"	0.72	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.15	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0.70	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.60	ES2003, p.52, Table 3.2	
two largest suppliers	"	0.68	ES2003, p.52, Table 3.2	
three largest suppliers	"	0.72	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.00		No entry for Italy in EC2003, p.9, Table 4. *Domestic* market not open in 2002, so 0% switching assumed
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.4, Table 1	(Ownership/Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.11, Table 5	(Regulation)
Unbundling at distribution level	Legal or ownership separation	N	EC2002, p.4, Table 1	(Legal)
rTPA at distribution level		Y	Assumed	

Italian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.75	EC2002, p.22, Table 9.	
two largest shippers	"	0.80	Assumed, based on EC2002, p.22, Table 9 column with no. of companies with at least 5% of available gas share	
three largest shippers	"	0.85	Assumed	"
Wholesale market				
Price reporting	Price information publicly available	N	No gas hub exists	
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.37	Energy policies of IEA countries: Italy 2003 review	
two largest suppliers	"	0.49	"	
three largest suppliers	"	0.52	Assumed	
Switching	% of eligible customers' gross switching	0.1	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.37	Energy policies of IEA countries: Italy 2003 review	
two largest suppliers	"	0.49	"	
three largest suppliers	"	0.52	Assumed	
Switching	% of eligible customers' gross switching	0	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.6, Table 2.	
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC 2002, Table 2, p.6	
Unbundling at distribution level	Legal or ownership separation	N	EC2002, p.6, Table 2	
rTPA at distribution level		Y	EC 2002, Table 2, p.6	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	National regulator	

Spanish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.40	ES2003, p.41, Table1.2	
two largest generators	"	0.68	ES2003, p.41, Table1.2	
three largest generators	"	0.77	ES2003, p.41, Table1.2	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.07	EC2002, Report, p.27, Table 11	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y	OMEL website	
Share of total (daily) volume traded covered by price reporting		1	"	
Standardised contracts		Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.40	ES2003, report, p.42, Table 3.2	
two largest suppliers	"	0.79	ES2003, p.42, Table 3.2	
three largest suppliers	"	0.88	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.20	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.40	ES2003, report, p.42, Table 3.2	
two largest suppliers	"	0.79	ES2003, p.42, Table 3.2	
three largest suppliers	"	0.88	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.20	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.11, Table 5	(Regulation)
Unbundling at distribution level	Legal or ownership separation	Y	EC2002, p.4, Table 1	(Legal)
rTPA at distribution level		Y	National regulator	Separate access tariffs for eligible market

Spanish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.75	EC2002, p.22, Table 9	
two largest shippers	"	0.80	Assumed based on EC2002, p.22, Table 9 column with no. of companies with at least 5% of available gas share	
three largest shippers	"	0.85	"	"
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		0.20		Based on gas release programme
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.65	CNE Report on Natural Gas Consumption in 2002, p.11	"Regulated' and "unregulated' distinction made rather than I&C and domestic distinction
two largest suppliers	"	0.77	"	
three largest suppliers	"	0.84	"	
Switching	% of eligible customers' gross switching	0.38	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/ consumption	0.81	CNE Report on Natural Gas Consumption in 2002, p.13	"Regulated' and "unregulated' distinction made rather than I&C and domestic distinction
two largest suppliers		0.96	"	
three largest suppliers		0.99	"	
Switching		0.01	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.6, Table 2.	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC 2002 Report., Table 2, p.6	
Unbundling at distribution level	Legal or ownership separation	Y	EC2002, p.6, Table 2.	(Legal)
rTPA at distribution level		Y	EC 2002 Report., Table 2, p.6	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	Assumed	Based on EC2002, p.71, Table 2

Swedish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.45	ES2003, p.70, Table 1.2	
two largest generators	"	0.64	ES2003, p.70, Table 1.2	
three largest generators	"	0.79	ES2003, p.70, Table 1.2	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.29	Assumed, based on 'Should the EU be investing in. cross- border electricity transmission capacity?', Dr John Bower, Research Symposium European Electricity Markets (Sept 03), organised by the Dutch Energy Council, CPB Netherlands Bureau for Economic Policy Analysis and the Energy Research Centre of the Netherlands; and EC2004, Benchmarking Report	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts.	rTPA	Assumed	Varies—rTPA assumed
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting		1	"	
Standardised contracts		Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.17	Igraninge Energy Company investor report (based on regulator data)	
two largest suppliers	"	0.35	"	
three largest suppliers	"	0.50	"	
Switching	% of eligible customers' gross switching	0.15	Assumed	No data entered in EC2003, p.9, Table 4. 15% assumed as least-biased estimate

Indicator	Definition	Assessment	Source	Comments
Downstream market				
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.17	Igraninge Energy Company investor report (based on regulator data).	
two largest suppliers	"	0.35	"	
three largest suppliers	"	0.50	"	
Switching	% of eligible customers' gross switching	0.10	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.11, Table 5	(Regulated)
Unbundling at distribution level	Legal or ownership separation	N	EC2002, p.4, Table 1	(Legal)
rTPA at distribution level		Y	Assumed	

Swedish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	1	EC2002, p.22, Table 9	
two largest shippers	"	1	EC2002, p.22, Table 9	
three largest shipper	"	1	EC2002, p.22, Table 9	
Wholesale market				
Price reporting	Price information publicly available	N	No gas hub exists	
Share of total (daily) volume traded covered by price reporting		0	"	
Standardised contracts		N	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	0.47	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	1	EC2002, p.24, Table 10	
two largest suppliers	"	1	EC2002, p.24, Table 10	
three largest suppliers	"	1	EC2002, p.24, Table 10	
Switching	% of eligible customers' gross switching	0	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0.47	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	1	EC2002, p.24, Table 10	
two largest suppliers		1	EC2002, p.24, Table 10	
three largest suppliers		1	EC2002, p.24, Table 10	
Switching		0	Assumed	No data entered in EC2002, p.9, Table 4

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.6, Table 2	(Accounting)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC 2002, Table 2, p.6	
Unbundling at distribution level	Legal or ownership separation	Y	EC2002, p.6, Table 2	(Accounting)
rTPA at distribution level		Y	EC 2002, p.6, Table 2	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	N	Assumed, based on EC2002, p.71, Table 2	

UK electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.14	OXERA generation database	
two largest generators	"	0.27	“	
three largest generators	"	0.39	“	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.03	EC2002, p.27, Table 11	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y	Energy Argus	
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y	UKPX	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.20	Assumed	Individual market shares confidential
two largest suppliers	"	0.40	Assumed	"
three largest suppliers	"	0.53	ES2003, p.75, Table 3.2	
Switching	% of eligible customers’ gross switching	0.15	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1.00	EC2002, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.22	Ofgem Domestic Competitive Market Review p.153	
two largest suppliers	"	0.39	"	
three largest suppliers	"	0.54	"	
Switching	% of eligible customers’ gross switching	0.12	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, Report, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, Report, p.11, Table 5	(Regulation)
Unbundling at distribution level	Legal or ownership separation	Y	EC2002, Report, p.4, Table 1	(Legal)
rTPA at distribution level		Y	Ofgem	

UK gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.50	EC2002, p.22, Table 9	
two largest shippers	"	0.55	Assumed, based on EC2002, p.22, Table 9 column with no. of companies with at least 5% of available gas share	
three largest shipper	"	0.60	Assumed	"
Wholesale market				
Price reporting	Price information publicly available	Y	ESGM	
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y	IPE	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.17	Assumed	Ofgem's review of non-domestic gas and electricity has data on the share of the three largest suppliers, and the HHI number. Using this data in tandem, estimates of 17%, 16% and 16% seem reasonable for the top three suppliers
two largest suppliers	"	0.33	Assumed	
three largest suppliers	"	0.49	Assumed	
Switching	% of eligible customers' gross switching	0.16	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2002, p.6, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.63	Ofgem Domestic Gas and Electricity Supply Competition, p.41 Chart 6.1	Based on March 2003 data
two largest suppliers	"	0.75	’	
three largest suppliers	"	0.84	’	
Switching		0.19	EC2003, p.9, Table 4	
Unbundling at transmission level	Legal or ownership separation	Y	EC2002, p.6, Table 2	(Ownership)
Network-related activities				
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC 2002, Table 2, p.6	
Unbundling at distribution level	Legal or ownership separation	Y	EC2002, p.6, Table 2	(Ownership)
rTPA at distribution level		Y	EC 2002, Table 2, p.6	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	Ofgem	

Appendix 2: Data Used for Indicator Evaluation, Preliminary 2003 Dataset

A2.1 Data availability, preliminary 2003 dataset

Electricity

Information missing	Austria	Finland	Italy	Spain	Sweden	UK
Upstream market data						
Market share of generators	Info n/a	Info n/a for third largest generator	Yes	Yes	Yes	Yes
Degree of technical openness of market	Yes	Yes	Yes	Yes	Yes	Yes
Openness of allocation mechanism to import capacity	Yes	Yes	Yes	Yes	Yes	Yes
Wholesale market data						
Share of total volume traded covered by price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Standardised contracts in wholesale markets	Yes	Yes	Yes	Yes	Yes	Yes
Downstream market data						
Degree of supply market opening	Yes	Yes	Yes	Yes	Yes	Yes
Market share of largest suppliers	Yes	Yes	Yes	Yes	Yes	Full info n/a for I&C suppliers
Switching rates	Yes	Yes	Yes	Yes	Yes	Yes
Network-related activities						
Unbundling at transmission level	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at transmission level	Yes	Yes	Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at distribution level	Yes	Yes	Yes	Yes	Yes	Yes

Gas

Information missing	Austria	Finland	Italy	Spain	Sweden	UK
Upstream market data						
Market share of shippers	Info n/a for second and third largest shippers		Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Yes	Full info n/a for second and third largest shippers
Wholesale market data						
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes
Share of total volume traded covered by price reporting	Yes		Yes	Yes	Yes	Yes
Standardised contracts in wholesale markets	Yes		Yes	Yes	Yes	Yes
Downstream market data						
Degree of supply market opening	Yes		Yes	Yes	Yes	Yes
Market share of suppliers	Info n/a for second largest supplier		Info n/a for second and third largest supplier	Yes	Info n/a for second largest supplier	Info n/a for second largest I&C supplier
Switching rates	Yes		Yes	Yes	Yes	Yes
Network-related activities						
Unbundling at transmission level	Yes		Yes	Yes	Yes	Yes
rTPA at transmission level	Yes		Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes		Yes	Yes	Yes	Yes
rTPA at distribution level	Yes		Yes	Yes	Yes	Yes
Competitive access to gas storage	Yes	Yes	Yes	Yes	Yes	Yes

A2.2 Detailed data, preliminary 2003 dataset

Austrian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.545	2003 E-control Annual Report p.25 has categories within market and overall HHI figures—used as basis for estimating market shares	
two largest generators	"	0.62	"	"
three largest generators	"	0.68	"	"
Degree of technical openness of market	Total interconnector capacity as % of peak demand	0.440	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y	Energy Exchange Austria	
Share of total (daily) volume traded covered by price reporting		0.5	"	
Standardised contracts		Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.20	Verbund 2003 Annual Report	
two largest suppliers	"	0.34	APC Press Release	
three largest suppliers	"	0.53	Bundeslastverteiler	
Switching	% of eligible customers' gross switching per annum	0.15	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.20	Verbund 2003 Annual Report	
two largest suppliers	"	0.34	APC press release	
three largest suppliers	"	0.53	Bundeslastverteiler	
Switching	% of eligible customers' gross switching	0.05	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Accounting)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Austrian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.91	EC2004, p.32, Table 13	
two largest shippers	"	0.96	Assumed, based on EC2002, p.22, Table 9	
three largest shippers	"	1	Assumed	
Wholesale market				
Price reporting	Price information publicly available	Y		A gas hub exists with limited liquidity
Share of total (daily) volume traded covered by price reporting	–	0.20	Assumed	Based on volumes in gas release programme
Standardised contracts	–	Y	Assumed	Standardised contract terms can be obtained at the Baumgarten hub
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.75	EC2004, p.33, Table 14	
two largest suppliers	"	0.85	Assumed	
three largest suppliers	"	0.9	EC2004, p.33, Table 14	
Switching	% of eligible customers' gross switching	0.06	EC2004, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.75	EC2004, p.33, Table 14	
two largest suppliers	"	0.85	Assumed	
three largest suppliers	"	0.9	EC2004, p.33, Table 14	
Switching	% of eligible customers' gross switching	0	EC2004, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	N	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Finnish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.40	EMA (regulator) website: http://www.energiamarkkinavirasto.fi/data.asp?articleid=232&pgid=127	
two largest generators	"	0.60	"	
three largest generators	"	0.65	Assumed	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.25	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		rTPA allocation method: market splitting. Allocation frequency: daily
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting	–	1	"	
Standardised contracts	–	Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.12	ES2003, p.69, Table 3.2	
two largest suppliers	"	0.23	ES2003, p.69, Table 3.2	
three largest suppliers	"	0.29	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.15	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.12	ES2003, p.69, Table 3.2	
two largest suppliers	"	0.23	ES2003, p.69, Table 3.2	
three largest suppliers	"	0.29	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.10	EC2003, p.9, Table 4	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003 p.4, Table 1	(Accounting)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Finnish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	1		Result of derogation
two largest shippers	"	1		
three largest shipper	"	1		
Wholesale market				
Price reporting	Price information publicly available	Y	www.energiamarkkinavirasto.fi/select.asp?gid=118&languageid	
Share of total (daily) volume traded covered by price reporting		0	Assumed	
Standardised contracts		N	Assumed	
Downstream market				
I&C				Because of the derogation and 0% market opening, the competitiveness indicators on market opening and customer switching are 0
Degree of supply market opening	% of total customer base in volume terms	0		
Market share of				Because of the derogation and 0% market opening share of supplier/s =100%
largest supplier	% of total supply/consumption	1		
two largest suppliers	"	1		
three largest suppliers	"	1		
Switching	% of eligible customers' gross switching	0		

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0		
Market share of				
largest supplier	% of total supply/consumption	1		
two largest suppliers	"	1		
three largest suppliers	"	1		
Switching		0		
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	N		
rTPA at transmission level	Tariffs imposed or approved by independent regulator	N		
Unbundling at distribution level	Legal or ownership separation	N		
rTPA at distribution level		N		
Competitive access to gas storage		N	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Italian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.49	The Reform of the Italian Electricity Markets, DN Consulting, p.9	
two largest generators	"	0.63	"	
three largest generators	"	0.70	"	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.12	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	N		Italian wholesale market did not come into existence in 2003 as planned
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.60	ES2003, p.52, Table 3.2	
two largest suppliers	"	0.68	ES2003, p.52, Table 3.2	
three largest suppliers	"	0.72	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0.15	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.60	ES2003, p.52, Table 3.2	
two largest suppliers	"	0.68	ES2003, p.52, Table 3.2	
three largest suppliers	"	0.72	EC2003, p.19, Table 5	
Switching	% of eligible customers' gross switching	0		
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003 p.4, Table 1	(Ownership/Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership/Legal)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Italian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.80	EC2004, p.32, Table 13	
two largest shippers	"	0.85	Assumed, based on EC2004, pp.32–3, companies with at least 5% market share	
three largest shippers	"	0.90	"	
Wholesale market				
Price reporting	Price information publicly available	N		No gas hub exists
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.93	Based on EC2004, p.33, Table 14	
two largest suppliers	"	0.95	Assumed, based on EC2004, p.33, Table 14 showing that only one company had >5%	
three largest suppliers	"	0.97	"	
Switching	% of eligible customers' gross switching	0.1	EC2004, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.93	EC2004, p.33, Table 14	
two largest suppliers	"	0.95	Assumed, based on EC2004, p.33, Table 14 showing that only one company had >5%	
three largest suppliers	"	0.97	"	
Switching	% of eligible customers' gross switching	0	EC2004, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Spanish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.40	ES2003, p.41, Table1.2	
two largest generators	"	0.68	ES2003, p.41, Table 1.2	
three largest generators	"	0.77	ES2003, p.41, Table 1.2	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.05	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y	OMEL website	
Share of total (daily) volume traded covered by price reporting		1	"	
Standardised contracts		Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.45	CNE Regulatory Update	Distinction is eligible and regulated tariff customers
two largest suppliers	"	0.83	"	
three largest suppliers	"	0.96	"	
Switching	% of eligible customers' gross switching	0.20	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.39	CNE Regulatory Update	Distinction is eligible and regulated tariff customers
two largest suppliers	"	0.76	"	
three largest suppliers	"	0.92	"	
Switching	% of eligible customers' gross switching	0.20	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Legal)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Spanish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.85	EC2004, p.32, Table 13	
two largest shippers	"	0.90	Assumed, based on EC2004, p. 32, Table 13—% of companies with at least 5% of market share	
three largest shippers	"	0.95	"	
Wholesale market				
Price reporting	Price information publicly available	Y		Gas release programme
Share of total (daily) volume traded covered by price reporting		0.20		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.64	CNE Regulatory Update	
two largest suppliers	"	0.76	"	
three largest suppliers	"	0.83	"	
Switching	% of eligible customers' gross switching	0.38	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/ consumption	0.81	CNE Regulatory Update	
two largest suppliers		0.96	"	
three largest suppliers		0.99	"	
Switching		0.01	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Swedish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.49	Electricity Market 2003, published by STEM—Swedish Energy Agency, Table 8, p.19	Data converted into a percentage
two largest generators	"	0.69	"	"
three largest generators	"	0.860	"	"
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.29	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts.	rTPA	Assumed	Varies—rTPA assumed
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting		1	"	
Standardised contracts		Y	"	
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.17	Igraninge Energy Company Investor Report (based on regulator data)	
two largest suppliers	"	0.35	"	
three largest suppliers	"	0.50	"	
Switching	% of eligible customers' gross switching	0.15	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of		0.17	Igraninge Energy Company Investor Report (based on regulatory data)	
largest supplier	% of total supply/consumption	0.35	"	
two largest suppliers	"	0.50	"	
three largest suppliers	"	0.10	EC2003, p.9, Table 4	
Switching	% of eligible customers' gross switching			
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Legal)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Swedish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.90	IEA 2004 review	
two largest shippers	"	0.95	"	
three largest shipper	"	1.00	"	
Wholestream market				
Price reporting	Price information publicly available	N		No gas hub exists
Share of total (daily) volume traded covered by price reporting		0		"
Standardised contracts		N		"
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	0.51	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.55	EC2004, p.33, Table 14	
two largest suppliers	"	0.7	Assumed	
three largest suppliers	"	0.86	EC2004, p.33, Table 14	
Switching	% of eligible customers' gross switching	0	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0.51	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.55	EC2004, p.33, Table 14	
two largest suppliers		0.7	Assumed	
three largest suppliers		0.86	EC2004, p.33, Table 14	
Switching		0	Assumed	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Accounting)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Accounting)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y		

UK electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.16	OXERA generation database	
two largest generators	"	0.29	"	
three largest generators	"	0.39	"	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.03	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts.	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.22	Assumed	
two largest suppliers	"	0.43	Assumed	
three largest suppliers	"	0.54	ES2003, p.75, Table 3.2	
Switching	% of eligible customers' gross switching	0.15	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.24	Ofgem *Domestic* Competitive Market Review p.153	
two largest suppliers	"	0.45	"	
three largest suppliers	"	0.60	"	
Switching	% of eligible customers' gross switching	0.12	EC2003, p.9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Ownership)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

UK gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.25	EC2004, p.32, Table 13	
two largest shippers	"	0.45	Assumed, based on EC2004, p.32, Table 13—no. of companies with at least 5% of market share	
three largest shipper	"	0.60	"	
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1		
Market share of				
largest supplier	% of total supply/consumption	0.2	EC2004, p.33, Table 14	
two largest suppliers	"	0.39	Assumed	Linear solution applied
three largest suppliers	"	0.59	EC2004, p.33, Table 14	
Switching	% of eligible customers' gross switching	0.16	EC2004, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.63	Ofgem Domestic Gas and Electricity Supply Competition, p.41 Chart 6.1	
two largest suppliers	"	0.75	’	
three largest suppliers	"	0.84	’	
Switching		0.19	EC2004, p. 9, Table 4	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Ownership)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	Y	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Denmark electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	% of total available capacity	0.37	ES2003, Table 1.2, p.30	
two largest generators	"	0.73	ES2003, Table 1.2, p.30	
three largest generators	"	0.75	Assumed	
Degree of technical openness of market	Total interconnector capacity as share of peak demand	0.51	EC2003, p.20, Table 6	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.19	DERA	
two largest suppliers	"	0.29	DERA	
three largest suppliers	"	0.39	DERA	
Switching	% of eligible customers' gross switching	0.45	EC2003, p.9, Table 4	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	1	EC2003, p.4, Table 1	
Market share of				
largest supplier	% of total supply/consumption	0.19	DERA	
two largest suppliers	"	0.29	DERA	
three largest suppliers	"	0.39	DERA	
Switching	% of eligible customers' gross switching	0.5	2003 NESA report	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Legal)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	(Legal)
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Denmark gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	% of total gas sources by shipper	0.90	EC2004, p.32, Table 13	
two largest shippers	"	0.95	Assumed, based on EC2004, p.32, Table 13—no. of companies with at least 5% of market share	
three largest shipper	"	0.97	"	
Wholesale market				
Price reporting	Price information publicly available	N		
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	% of total customer base in volume terms	0.35	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.73	EC2004, p.33, Table 14	
two largest suppliers	"	0.83	Assumed	
three largest suppliers	"	0.93	EC2004, p.33, Table 14	
Switching	% of eligible customers' gross switching	0.35	Danish Energy Authority Annual Report 2003, p.5	
Domestic				
Degree of supply market opening	% of total customer base in volume terms	0.35	EC2004, p.7, Table 2	
Market share of				
largest supplier	% of total supply/consumption	0.73	EC2004, p.33, Table 14	
two largest suppliers		0.83	Assumed	
three largest suppliers		0.93	EC2004, p.33, Table 14	
Switching		0	Assumed	

Indicator	Definition	Assessment	Source	Comments
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Ownership)
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2002, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.7, Table 2	(Legal)
rTPA at distribution level		Y	EC2002, p.13, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA (tariffs imposed or approved by independent regulator)	N	CEER Members—1st Provisional Questionnaire Results, Annex 1	

Appendix 3: Detailed Calculation of the US and Canadian Comparators

A3.1 Construction of a single US electricity composite

A3.1.1 Methodology

Tables A3.1 and A3.2 list the US states separated into two groups: those that pass the filters and those that do not, with the states sorted according to market size defined in terms of electricity retail sales. The market size data used has been determined by data availability and consistency between the 18 countries included in the PSA target—market size data for the USA, Canada and the EU Member States is needed for the creation of the composites. For reasons of concise presentation, only the ten largest states that do not pass the filters are presented in Table A3.2.

Tables A3.1 and A3.2 show that the states that pass the filters together account for 32.4% of the total US electricity market; this represents the 'X' identified in the methodology in section 3.1 in the 2003 main report.

California does not appear in the list of states considered among the most competitive electricity markets because of the measures imposed following the crisis in 2001, which led to the suspension of full retail market opening in September 2001.

Table A3.1: US states passing the filters for electricity markets, ranked by size

US state	100% open	Separation at transmission level[1]	rTPA[2]	Market size (2002) Total retail sales (GWh)
Ohio	Y	Y	Y	155,999
New York	Y	Y	Y	143,564
Pennsylvania	Y	Y	Y	140,787
Illinois	Y	Y	Y	137,666
Michigan	Y	Y	Y	107,311
Virginia	Y	Y	Y	100,541
New Jersey	Y	Y	Y	74,460
Maryland	Y	Y	Y	66,928
Arizona	Y	Y	Y	62,601
Massachusetts	Y	Y	Y	52,410
Connecticut	Y	Y	Y	30,906
Delaware	Y	Y	Y	11,557
District Of Columbia	Y	Y	Y	11,066
New Hampshire	Y	Y	Y	10,490
Maine	Y	Y	Y	9,636
Rhode Island	Y	Y	Y	7,544
Total (competitive states)				**1,123,464**
Total US electricity market				**3,462,521**
% of competitive US electricity market				**32.4**

Notes: [1] FERC Order 888 (1996) requires all public utilities that own, control, or operate facilities used for transmitting electricity in interstate commerce to separate transmission from generation and marketing functions and communications. [2] FERC regulates wholesale electricity rates and services for wholesale transactions. According to Energy Information Administration (EIA) calculations in 2000, FERC had, at that time, jurisdiction over around 73% of the electricity transmission system in the USA. The remainder was federally owned, municipally owned or owned by cooperative
utilities outside of FERC's jurisdiction. Distribution rates are set by the state public utility commissions. In December 1999 FERC issued Order 2000 calling for the creation of regional transmission organizations (RTOs), independent entities that would control and operate the transmission grid, free of any discriminatory practices.

Sources: US Department of Energy, EIA website and 'The Changing Structure of the Electric Power Industry 2000: An Update'; FERC; The Center for the Advancement of Energy Markets, 'Retail Energy Deregulation index 2002'; market size data compiled from the state profiles on the EIA website.

Table A3.2: US states not passing the filters for electricity, ranked by size (10 largest states only)

US state	Market size (2002) Total retail sales (GWh)
Texas	320,846
California	235,249
Florida	210,474
Georgia	123,789
North Carolina	122,686
Indiana	101,429
Tennessee	98,233
Kentucky	87,267
Alabama	83,067
Louisiana	79,261
[…]	
Total (non-competitive states)	**2,339,057**
Total US electricity market	**3,462,521**
% of non-competitive US electricity market	**67.6**

Note: [1] The Texan electricity market is often described as 100% open. However, upon closer examination, only the market of the investor-owned utilities (IOUs) is open. In some cases this represents a minor adjustment, but, in the case of Texas, only a 70% degree of market opening is achieved if all the non-liberalised parts of the market are considered. The Retail Energy Deregulation index provides insight into these detailed analyses. [2] The Californian electricity market had full retail access from March 31st 1998 until its suspension in September 2001.
Source: Market size data compiled from the state profiles on the EIA website.

If the critical mass for the single US composite in electricity is defined as similar to the largest EU market then it is the German market which provides the indication for the size of the US composite: the total size of the German electricity market is 536 TWh (electricity supplied in 2002).[1]

Given this indication of the critical size for the US composite, states must have an aggregate market size of at least 173.6 TWh (536 × 0.324) to pass the filters. Taking the largest state from Table A3.1 first, Ohio, gives a market size of 155.9 TWh. Thus, the comparator needs to be scaled up to maintain the ratio 32:68 between competitive and non-competitive states.

After proportional adjustment, the threshold for the uncompetitive states becomes 331.28 TWh (ie, 155.9 × (0.68/0.32)). Adding California and Georgia (ie, 359.03 TWh) gives a total market indicator with 155.9 TWh competitive and 359.03 TWh non-competitive market volumes—ie, a broad ratio of 30:70, which lies within the buffer for the ratio, and no further iteration is thus required.

In summary, the composite indicator for the US electricity market would take into account the markets of Ohio, California and Georgia.

A3.1.2 Aggregation of sub-markets

In view of the initial analysis above, the representative US electricity market composite is constructed on the basis of a proportional mix of liberalised and non-liberalised US states, and takes into account the markets of Ohio, Georgia and California. The filter information on these three states is summarised in Table A3.3, together with market size information used as weights for the aggregation of the composite.

Table A3.3: Construction of US electricity market comparator

US electricity market	Degree of market opening (%)	Market size (1999) Total retail sales (GWh)	Relative market size in composite (%)
Ohio	100	155,999	30
Georgia	0	123,789	24
California	None (suspended)	235,249	46
Total market size of composite	–	515,037	100
Composite US electricity market comparator	30.3	–	–

Using market size as weights, it is possible to construct a theoretical US electricity market comparator with a 30.3% degree of market opening and passing the filters of transmission unbundling and rTPA.

A3.2 Construction of a single US gas composite

A3.2.1 Methodology

Tables A3.4 and A3.5 separate the US gas markets into those that pass the filters and those that do not. As for the electricity markets, the states in both groups are sorted according to market size (defined in terms of gas consumption). Again, only the largest states that do not pass the filters are

[1] IEA website; Eurostat, 'Electricity Statistics', 4/2003.

presented in Table A3.5. Tables A3.4 and 3.5 show that the group of states that pass the filters account for 19.8% of the total US gas market, leading to a ratio of 20:80 of competitive versus non-competitive market parts for US gas.

Table A3.4: US states passing the filters for gas market, ranked by size

US state	100% open	Separation at transmission level	rTPA	Market size (2003) Consumption (BCF), residential and commercial customers
New York	Y	Y	Y	713
Pennsylvania	Y	Y	Y	420
New Jersey	Y	Y	Y	356[1]
West Virginia	Y	Y	Y	58
New Mexico	Y	Y	Y	56
District of Columbia	Y	Y	Y	33
Total (competitive states)				**1,636**
Total US gas market				**8,246**
% of competitive US gas market				**19.8**

Note: [1] 2002 figure.
Source: US Department of Energy, Energy Information Administration.

Table A3.5: US states not passing the filters, ranked by size (10 largest states only)

US state	Market size (2003) Consumption (BCF), residential and commercial customers
California	728
Illinois	683
Michigan	571
Ohio	520
Texas	382
Indiana	245
Minnesota	239
Wisconsin	226
Colorado	186
Georgia	184
[…]	
Total (non-competitive states)	**6615**
Total US gas market	**8,246**
% of non-competitive US gas market	**80.2**

Source: EIA website.

If the critical mass for the US composite in gas is defined as equal to the largest EU gas market then the UK provides the indication for the size of the composite. The size of the UK gas market is 3,479 BCF (gas consumption in 2003).[2]

Therefore, the composite indicator requires states with an aggregate market size of 689 BCF (3,479 × 0.198) to have passed the filters. Taking the largest state from Table A3.4 first, New York, gives a volume of 713 BCF, which is within the 5% buffer zone defined in the methodology. The comparator size needs to scaled up only slightly to maintain the ratio 20:80 between competitive and non-competitive states.

[2] Natural gas consumption in Europe in 2003, Eurogas Press Release. Conversion from petajoule into BCF undertaken with a conversion factor of 1.05PJ=1BCF.

After proportional adjustment, the threshold for the non-competitive states becomes 2,852 BCF (ie, 713 × (0.8/0.2)). Adding California, Illinois, Michigan, Ohio and Texas (ie, 2,883 BCF) gives a total market indicator, with 713 BCF competitive and 2,883 BCF non-competitive market volumes (ie, a ratio of 20:80).

Thus, the composite indicator for the US gas market will take into account the markets of New York, California, Illinois, Michigan, Ohio, and Texas.

A3.2.2 Aggregation of sub-markets

The composite US gas market comparator is constructed on the basis of the markets of New York, California, Illinois, Michigan, Ohio and Texas. The filter information on these six states is summarised in Table A3.6 below, together with the market size information used to create the weighted composite.

Table A3.6: Construction of US gas market comparator

US gas market	Degree of market opening (%)	Transmission unbundling	rTPA	Market size (2003) Consumption (BCF)	Relative market size in composite (%)
New York	100	Y	Y	713	20
California	0[1]	Y	Y	728	20
Illinois	56.5	Y	Y	683	19
Michigan	74.9	Y	Y	571	16
Ohio	91.2	Y	Y	520	14
Texas	None	Y	Y	382	11
Total market size of composite	–	–	–	3,597	100
Composite US gas market comparator	56	Y	Y	–	–

Note: [1] implementation phase.

Using market size as weights, the resulting theoretical US gas market comparator displays 56% degree of market opening and passes the filters of transmission unbundling and rTPA.

A3.3 Construction of a single Canadian electricity composite

A3.3.1 Methodology

Tables A3.7 and A3.8 list the Canadian provinces separated into two groups: those that pass the filters for electricity and those that do not, sorted according to market size defined in terms of electricity retail sales. The tables show that the ratio between competitive and non-competitive provinces is 37:63.

Table A3.7: Canadian provinces passing the filters for electricity markets, ranked by size

Canadian province	100% open	Separation at transmission level	RTPA	Market size (2003) Electricity generation (GWh)
Ontario	Y	Y	Y	149,685
Alberta	Y	Y	Y	56,461
Total (competitive provinces)	**–**	**–**	**–**	**206,146**
Total Canadian electricity market	**–**	**–**	**–**	**560,901**
% of competitive Canadian electricity market	**–**	**–**	**–**	**36.7**

Sources: National Energy Board, Statistics Canada, and provincial governments.

Table A3.8: Canadian provinces not passing the filters for electricity, ranked by size

Canadian province	Market size (2003) Electricity generation (GWh)
Quebec	177,293
British Columbia	63,051
Newfoundland and Labrador	42,039
Manitoba	21,152
New Brunswick	19,249
Saskatchewan	18,499
Nova Scotia	12,387
Northwestern Territories	588
Yukon	320
Nunavut	133
Prince Edward Island	42
Total (non-competitive provinces)	**354,755**
Total Canadian electricity market	**560,901**
% of non-competitive Canadian electricity market	**63.3**

Source: Statistics Canada

British Columbia, Saskatchewan, Manitoba, and Quebec all offer wholesale access to transmission. New Brunswick has a new Electricity Act, which allows wholesale access from April 2004. In October 2003, Nova Scotia's Electricity Marketplace Governance Committee released its final report, in which it recommend introduction of limited competition in the province's electricity marketplace, with the wholesale market expected to open in 2005.

To define the critical mass, C, for the Canadian market, a market size is chosen reflecting the relative proportions of the US and Canadian markets. The reason for not adopting a market size based on an EU market—as was done for the US case described above—is that the Canadian market is relatively small, and a large EU market would represent a large proportion, if not all, of the Canadian energy market.

The total size of the Canadian electricity market of around 560 TWh represents 16.2% of the total US electricity market size of 3,462 TWh. Considering that the US composite constructed above had a size of 1,123 TWh, the Canadian electricity composite should be scaled at 182 TWh (1,123 × 0.162).

Given this indication of the critical size for the Canadian composite, the latter requires provinces with an aggregate market size of 67.3 TWh (182 × 0.37) to have passed the filters. Taking the largest state from Table A3.7 first, Ontario, gives a volume of approximately 149.7 TWh, and thus the comparator needs to be scaled up significantly to maintain the ratio of 39:61 between competitive and non-competitive Canadian provinces.

After proportional adjustment, the threshold for the non-competitive provinces becomes 254.9 TWh (ie, 149.7 × (0.63/0.37)). Adding Quebec and British Columbia (ie, 240 TWh) gives a total market indicator, with 149.7 TWh competitive and 240 TWh non-competitive market volumes—ie, a broad ratio of 38:62, which lies within the 5% buffer area and no further iteration is required.

The composite indicator for the Canadian electricity market should therefore take into account the three markets of Ontario, Quebec and British Columbia.

A3.3.2 Aggregation of sub-markets

The composite Canadian electricity market comparator is constructed on the basis of the provincial markets of Ontario, Quebec, and British Columbia. The filter information on these three states is summarised in Table A3.9.

Table A3.9: Construction of Canadian electricity market comparator

Canadian electricity market	Degree of market opening (%)	Transmission unbundling	rTPA	Market size (2003) Electricity generated (GWh)	Relative market size in composite (%)
Ontario	100	Y	Y	149,685	38.4
Quebec	None (wholesale access only)	Y (functional)	Y	177,293	45.5
British Columbia	Approx. 10[1]	N [2]	Y	63,051	16.12
Total market size of composite	–	–	–	390,029	–
Composite Canadian electricity market comparator	39.9	N	Y	–	–

Notes: [1] Retail access is available only to the large industrial customers of Aquila Networks. [2] British Columbia plans to introduce competition to wholesale and large industrial customers by December 2004.

The theoretical Canadian electricity market composite has a calculated degree of market opening of 39.9% and passes the filter of rTPA, but not of transmission unbundling. This is because it is assumed that all sub-markets need to satisfy the filters in order for the composite to do so.

A3.4 Construction of a single Canadian gas composite

A3.4.1 Methodology

Tables A3.10 and A3.11 separate the provincial Canadian gas markets into those that pass the filters and those that do not. As for the electricity markets, the states in both groups are being sorted according to market size (defined in terms of gas consumption). The tables show that the ratio of competitive to non-competitive Canadian gas markets is 56:44.

Table A3.10: Canadian provinces passing the filters for gas market, ranked by size

Canadian province	100% open	Separation at transmission level	rTPA	Market size (2002) Total consumption (BCF)[3]
Ontario	Y	N?[1]	Y	806
Quebec	Y	Y	Y	225
Saskatchewan	Y	Y	Y	114
New Brunswick	Y	Y	Y	0
Total (competitive provinces)	**–**	**–**	**–**	**1,145**
Total Canadian gas market	**–**	**–**	**–**	**2,054**
% of competitive Canadian gas market	**–**	**–**	**–**	**56**

Notes: [1] The situation with regard to transmission separation in the Ontario gas market is not entirely clear at this point. However, at least one of the local distribution companies also has a transportation and storage business.
Source: Office of Energy Efficiency, Natural Resources Canada, and Statistics Canada, 'Comprehensive Energy Use Database'.

Table A3.11: Canadian provinces not passing the filters, ranked by size

Canadian province	Market size (2002) Total consumption (BCF)
Alberta[1]	534
British Columbia and territories	289
Manitoba	72
Atlantic[2]	14
Total (non-competitive provinces)	**909**
Total Canadian gas market	**2,054**
% of non-competitive Canadian gas market	**44**

Notes: [1] It was difficult to confirm whether there is any requirement that transmission be unbundled from supply in the Alberta gas market. However, an Albert Government Department of Energy press release dated August 21st 2002 stated that 'the market can serve customers best if ownership of the retail market is separate from ownership of the wires and pipelines. The government will not mandate the separation but will remove systemic barriers, which inhibit separate ownership'. OXERA notes that one of the two major gas transmission pipelines in Alberta is an associate company of ATCO Gas, one of the IOUs. [2] Atlantic encompasses New Brunswick, Nova Scotia and Prince Edward Island.
Source: Office of Energy Efficiency, Natural Resources Canada, and Statistics Canada, ' Comprehensive Energy Use Database'.

To define the critical mass, C, for the Canadian gas market, the relative size of the Canadian gas market compared with the US gas market needs to be determined. The total size of the Canadian gas market is 2,054 BCF, representing 24% of the total US gas market, the size of which is 8,246 BCF. Considering that the US gas composite had a size of 1,636 BCF, the Canadian gas composite should be scaled at 393 BCF (1,636 × 0.24).

Given this critical size for the Canadian composite, the latter requires provinces with an aggregate market size of 220 BCF (393 × 0.56) to have passed the filters. Taking the largest province from Table 3.10 first, Ontario, gives a volume of 806 BCF, and thus the comparator needs to be scaled up significantly to maintain the ratio 56:44 between competitive and non-competitive Canadian provinces.

After proportional adjustment, the threshold for the non-competitive states becomes 633 BCF (ie, 806 × (0.44/0.56)). Adding Alberta (ie, 534 BCF) will lead to a total market indicator with 806 BCF competitive and 534 BCF non-

[3] The total gas numbers reported by Statistics Canada relate to secondary energy use and do not include natural gas used for electricity generation or other transformations.

competitive market volumes—ie, a broad ratio of 60:40, which lies inside the 5% buffer.

Thus, the composite indicator for the Canadian gas market would take into account the two markets, Ontario and Alberta.

A3.4.2 Aggregation of sub-markets

The composite Canadian gas market comparator is constructed on the basis of the markets of Ontario and Alberta. Table A3.12 summarises the filter information.

Table A3.12: Construction of Canadian gas market comparator

Canadian gas market	Degree of market opening (%)	Transmission unbundling	rTPA	Market size (2001) Consumption (BCF)	Relative market size in composite (%)
Ontario	100	N?[2]	Y	806	60
Alberta	88[1]	N/Y (functional)[3]	Y	534	40
Total market size of composite	–	–	–	1,340	100
Composite Canadian gas market comparator	95.2	N	Y	–	–

Notes: [1] In the Alberta gas market, small industrial customers have been able to choose their supplier since 1988. Retail supply has been fully open in some areas since 1996, although competitive offerings are not available to all domestic customers, as only the two IOUs, ATCO Gas and AltaGas Utilities, are required to provide consumers with the option of buying from a marketer. Customers of rural gas cooperatives do not have the option to buy from a competitor unless they are a non-farm customer using more than 10,000 GJ per annum. Although municipally owned utilities may allow their customers to buy from a marketer, they are not required to do so. [2] It is proving difficult to confirm whether there is any requirement that transmission be unbundled from supply in the Alberta gas market. However, an Albert Government Department of Energy press release dated August 21st 2002 stated that 'the market can serve customers best if ownership of the retail market is separate from ownership of the wires and pipelines. The government will not mandate the separation but will remove systemic barriers, which inhibit separate ownership'. OXERA notes that one of the two major gas transmission pipelines in Alberta is an associate company of ATCO Gas, one of the IOUs. [3] Similarly, the situation with regard to transmission separation in the Ontario gas market was unclear. However, at least one of the local distribution companies also has a transportation and storage business.

Using market size as weights, the resulting theoretical Canadian gas market comparator displays a 95.2% degree of market opening, passing the filters of rTPA, but not of transmission unbundling.