

Electricity Disclosure: Status and Perspectives

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by

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1 From Generic Electricity to Differentiated Products

Since the early 1990's, the regulatory environment for electricity changed in most countries: formerly monopolistic structures of power supply were exposed to competition, and customers were offered the opportunity to choose among suppliers.

In stark contrast to earlier times when customers could buy only a standardized, generic product from one provider, there are now, in many markets, a variety of electricity "packages", ranging from unspecified low-cost to environmental ("green") electricity from renewable sources.

In May 2000, the Washington office of the Heinrich Böll Foundation, in cooperation with the Center for Clean Air Policy and Öko-Institut, organized a conference on electricity restructuring and the environment (see Böll/CCAP/OEKO 2000).

One of the questions raised there concerns the issue of *customer choice*:

Will consumers be able to cope with the newly liberalized electricity markets and the new possibilities of choosing their suppliers? And will they have adequate information to make informed choices? Beyond prices, the fuel mix of electricity generation, and its environmental impacts could be decisive factors for (some) customers.

Electricity disclosure could help to bring transparency into the market, thus enabling customers to make informed choices.

This paper gives an overview of the various electricity disclosure activities around the world, and highlights some of the remaining challenges for a "full" disclosure. Currently, the information to be disclosed by electricity suppliers varies from country to country, and – as in the USA - even within countries.

Since the late 1990's, about *half of all US States* individually introduced their own electricity disclosure schemes (see Section 4.1). Canada (Section 4.2) and Australia (Section 4.3) also started to introduce disclosure policies.

In *Europe*, the European Commission introduced a directive on electricity disclosure for renewable electricity, thus creating a uniform framework for all EU Member States (see Section 4.7).

Meanwhile, the European countries Austria (Section 4.4), and Switzerland (Section 4.5), have introduced electricity disclosure rules independently, and other countries like the Netherlands (Section 4.6) and Germany are likely to follow.

2 Differences between Disclosure, and Green Electricity Labels

Electricity disclosure is a policy-based tool that offers *objective* information to customers without evaluating or judging the quality of the electricity products. The policy requires labels containing facts that are relevant to facilitate customer choice. Each and every electricity product can be disclosed, disregarding source, supplier, or contract.

On the other hand, *green electricity labels* or product certification is an optional, market-based tool that emphasizes preferences. These labels usually consist of a seal of approval based on defined minimum requirements (or standards) for electricity products. These minimum requirements are based on *subjective* values of the issuing organization. To be labeled “green“, an electricity product must fulfill these requirements, and is subject to independent review regarding the quality of the product.¹

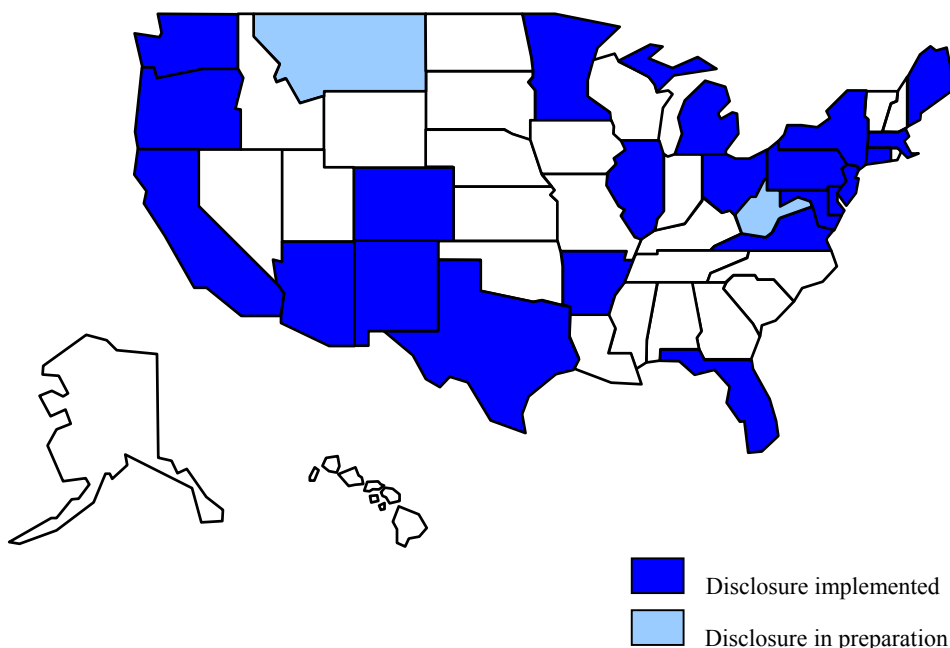
4 International Status of Electricity Disclosure

Information disclosure has been discussed as a means of informed choice and to support competition in the electricity sector since 1996. It is now being required and implemented in a growing number of countries as a critical element of electricity restructuring policies. This section gives a brief overview of the status in North America, Australia, and Western Europe.

4.1 USA

Currently, 22 US states and the District of Columbia have legally implemented disclosure rules for electricity (see also list in the Appendix).²

Figure 1: Status of Electricity Disclosure in the USA



¹ Öko-Institut developed a green electricity label which is now fully implemented by the association “EnergieVision“, a cooperation of Öko-Institut with WWF Germany, and the Consumer Center Northrhine Westfalia (Verbraucher-Zentrale Nordrhein-Westfalen). For more information on the “ok-power“ label, see www.energievision.de or www.ok-power.de.

² An overview on the current state of electricity disclosure in the USA can be found in the Internet on <http://www.eren.doe.gov/greenpower/disclosetxt.shtml>

On the federal level, there is no requirement for electricity disclosure as yet, although it has been included in several legislative proposals. Even if disclosure were required by the federal government, it would probably leave many of the implementation details to state regulators. Because a broad variety of different schemes might impede electricity markets, the New England States developed a joint framework for electricity disclosure (RAP 1998), and western states have discussed a joint tracking system, but this has been slowed by the problems with the California market and delayed restructuring in other states.

The majority of states require disclosure of generation mix and emissions, and several states also require disclosure of average product prices. In most states the disclosure of the information is mandatory, and most states also require a standardized format, or label, for displaying the information.

The generation (fuel) mix for the electricity products is always given in shares (percentages). Regarding emissions, most states require data on carbon dioxide (CO₂), nitrogen oxides (NO_x), and sulfur dioxide (SO₂), and in a few states, nuclear wastes.

The majority of states require disclosure for single products, while a minority of states require disclosure for the supplier's portfolio of resources. In some States, consumers can access data on both individual products and the supplier company.

Mandatory, standardized disclosure of electricity information has been acknowledged as a successful instrument to facilitate consumer choice in competitive electricity markets (USFTC 2000). Even several states that have not liberalized their electricity markets have introduced disclosure requirements to inform and educate consumers.

Although some market participants and renewable energy advocacy groups view disclosure as a means to motivating consumers to choose cleaner green power products, others argue that information disclosure allows consumers to act on their preferences but does not change their preferences.

4.2 Canada

Competition in the electricity sector of the Canadian province of Ontario was introduced in May 2002, but electricity disclosure has been mandatory since March 2000.

A Directive of the Ontario Energy Board specifies which information electricity suppliers must disclose (OEB 2000), i.e. data on the primary energy mix of the electricity supply in Ontario. For each product sold to consumers, the specific fuel mix must be shown in addition to the provincial average. The following figure shows the product label for electricity disclosure in Ontario.

Figure 2: Product Specific Disclosure Label for Ontario

Electricity Sources	"GreenPower Inc" (projected)	Ontario's Electricity Mix*
Water Power	30%	24%
Alternative sources:	30%	2%
Solar	-	-
Wind	-	-
Biomass	-	-
Waste	-	-
Nuclear Energy	35%	39%
Natural Gas	5%	5%
Coal or Oil	0%	30%
* The combination of electricity sources used to generate the electricity consumed in Ontario in 1998 (Statistics Canada Catalogue No. 75-001-XPB for 1998 and Ministry of Energy, Science and Technology)		

4.3 Australia

The State of New South Wales (NSW) in Australia already accounts for the annual emissions of greenhouse-gases from electricity generation as a part of the concession rules for electricity supply, but this data is not offered to customers.

The first discussion paper on “Electricity Labelling“ was drafted by the Sustainable Energy Development Authority in NSW in September 1999 (SEDA 1999), arguing for electricity disclosure as an important contribution to competition, and to an informed customership.

In Summer 2001, SEDA published draft rules for electricity disclosure for comments (SEDA 2001, 2001a). Final implementation rules are now being prepared.

In addition, the State of Victoria also plans to introduce electricity disclosure.

4.4 Austria

In 2000, the Austrian Electricity Act (EIWOG) was passed. Section 45 of EIWOG requires each retail supplier in Austria to disclose on the electricity bill the primary energy sources used to generate the electricity. The disclosure requirement became effective October 2001.

Although Elektrizitäts-Control GmbH (E-Control) is responsible for overall implementation of the law, the individual federal states are free to design their own label. E-Control has made a recommendation for how the energy sources could be presented, but some states allow product information to be displayed, while other states insist on company-wide disclosure.

The information given refers to the most recent financial year.

4.5 Switzerland

In Switzerland, disclosure is supposed to accompany the opening of the electricity market.³ The electricity market regulation from March 2002 is meant to oblige all generators, suppliers, and traders of electricity to display on their offers and bills the generation type and country of origin of the electricity offered.⁴

The primary fuel source categories are hydro, nuclear, coal, oil, biomass, waste, solar, and wind. Electricity from unknown sources has to be disclosed as such.

Both the opening of the market and electricity disclosure are subject to a referendum to be held in September 2002.

4.6 Netherlands

The Dutch Parliament is discussing a draft electricity disclosure law that is widely supported. In this draft, all suppliers would be required to disclose their average mix of primary energy sources in a uniform manner. Imports would be disclosed either according to the generation mix of the exporting country or as electricity of unknown origin.

In December 2001, the Dutch Ministry of Economic Affairs announced a disclosure proposal that focuses on a common European solution in a letter to the Parliament.

As a first step, the suppliers should be obliged to disclose the primary energy mix of their electricity purchase once a year from 2004 on, when the electricity market will be fully liberalized.

Further steps towards a more detailed disclosure should be taken within the European framework.

4.7 Developments on the EU Level

According to Article 5 of the EU directive to support electricity generation based on renewable energy sources,⁵ all Member States must be able to verify the primary energy used to generate electricity from renewable resources. A system for this “guarantee of origin” must be established in each Member State by October 2003. The purpose of the guarantee of origin is to track progress towards the renewable energy directive goal, rather than to support consumer information disclosure, but the effect is similar to partial disclosure.

³ Enacted in December 2000, the electricity market law empowers the government to introduce electricity disclosure (EMG, Art. 12).

⁴ Electricity market regulation (EMV) as of March 27, 2002, Art. 16.

⁵ Directive 2001/77/EG as of September 27, 2001.

In the course of the debate of this directive in the European Parliament, a universal guarantee of origin or disclosure for all kinds of energy sources was requested, but was not included in the directive.

General electricity disclosure has again been taken up by the EU Commission in its proposed directive for the internal market of electricity and gas. According to this proposal, contract information, the primary energy mix, as well as GHG emissions are to be disclosed to the consumers.

The Commission proposal was amended by the EU-Parliament suggesting the disclosure of both product and company portfolio information. Additional information would include the cogeneration share as well as the country of origin.

The proposal is still under consideration and consultation by the European Council and the Parliament; the completion of the debate is expected for fall 2002.

In May 2002, the German Minister of Economic Affairs militated in favor of electricity disclosure.

4.8 Summary

Electricity disclosure has been adopted successfully in several countries and states. Even though each country/state has chosen a different approach, the *general feasibility* of electricity disclosure has been proven.

The actual effect of information disclosure has not been evaluated, however. This is because electricity markets with information disclosure have not been open to consumer choice long enough, or there has not been enough competition to present alternatives where an electricity label could assist consumers. This work remains to be done.

In the US, a number of states have introduced disclosure without interstate coordination. Europe might have to cope with a similar situation: Several European countries are active in the field of electricity disclosure, but the resulting initiatives might not necessarily be compatible.

The EU Commission is striving for harmonization because greater uniformity among countries would increase consumer understanding and acceptance, as well as facilitate tracking of cross-border trade.

5 Towards A General Electricity Disclosure Scheme

A procedure for electricity disclosure should offer customers credible data needed to make informed decisions. In the following, the basic elements of a generic electricity disclosure scheme are given with special emphasis on Germany.

This concept takes into account the respective experiences from other countries (see Section 4). Still, some aspects can be outlined only in draft form, as they are subject to ongoing research.

Voluntary vs. Mandatory Disclosure

Because information on the price and environmental characteristics (fuel mix, emissions) of electricity products are crucial for fair competition and consumer choice, all electricity suppliers should be subject to a *mandatory* disclosure scheme. This would allow for a more efficient monitoring and verification than a voluntary scheme, because fraud could be traced more easily with fully implemented disclosure for all suppliers, and all electricity products.

Therefore, a voluntary disclosure scheme can only be an interim step during a process of full disclosure. Mandatory disclosure for all products also facilitates comparison shopping and consumer “right-to-know.” Research in the US demonstrates that consumer accuracy (ability to accurately identify the lowest cost product, for example) increased from 66% to 91%, when all products are labeled, compared to when only some products are labeled.⁶

Which Information Should be Offered to Consumers?

Electricity disclosure should focus on information that consumers want and need to make an informed decision. Results from customer research in the US, and Switzerland indicate that consumers consistently want information about prices and environmental characteristics that will enable them to easily compare the choices available to them.

As to prices, consumers want a transparent disclosure of total generation cost for typical consumers (e.g., based on household sizes). For contracts, the duration of the agreement, and possible fixed charges, are most relevant.

The *environmental* aspects of disclosure should focus on primary energies (or fuels), and also indicate the most relevant environmental burdens associated with electricity generation, i.e., greenhouse gases, air pollutants, and nuclear wastes.⁷ To support better understanding by consumers, emissions data should be accompanied by a reference value (e.g., country average) for each pollutant that reflects the generic generation.⁸

⁶ See Winneg et al. 1998.

⁷ The greenhouse gases should be expressed in CO₂ equivalents, the air pollutants as SO₂ equivalents. When the data is given relative to an average, the nuclear wastes could be indicated by the relative share of nuclear electricity on the total generation mix for the respective electricity product.

⁸ It is recommended to use the average generation data for powerplants.

As generation mixes for electricity products often change over time, a reference time for the data must be given. Reliable data can be defined only for the past, so that the reference period for the environmental disclosure should be the past year.

Interested customers should be able to access more detailed information than can be disclosed in a label, e.g., refined data on prices and contracts, geographical mixes of imports, company information, etc. This data could be offered in the internet, or in annual reports of the suppliers, and on request.

Disclosure of Products vs. Suppliers

In general, the disclosure of electricity should be given for individual products. As a supplement, the disclosure of the total generation portfolio of the supplier (including imported, or traded electricity) should be mandatory, so that the total of all products offered by a certain supplier is available to interested consumers. This would provide insight to suppliers that promote a “green” product, but deliver the bulk of their electricity from fossil or nuclear resources.

Uniform vs. Non-Uniform Labels

The label format should be specified so that information will be presented in a standard manner. This makes it easier for consumers to compare labels and products, and reduces the possibility for retailers to disguise their information or confuse consumers with alternative formats of their own making. Again, US research shows that consumers use the labels more accurately if the labels are presented in a standard format. Consumers were able to accurately identify the lowest emissions product 53% of the time when products had different label formats, compared to 88% of the time when all products had the same label format.⁹

How Should Information Be Disclosed?

Electricity disclosure is meant to increase market transparency, and support informed decisions of consumers. Therefore, all disclosed information should be inserted *with* the bill. Print advertisements (newspapers, bill boards, etc.) should offer a web address or a toll-free phone number where customers could get more information about products. On the other hand, printed brochures, direct mail, etc. should include the label.


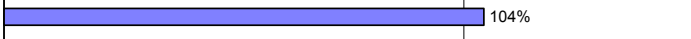

Figure 3 depicts a draft disclosure label that meets the needs for an informed customer choice, thus bringing transparency into the market¹⁰.

Ideally, all means of supplier-customer communication (marketing material, internet, contracts, bills) should be equipped with such a label.

⁹ See Winneg et al. 1998.

¹⁰ This is oriented on the draft label for electricity disclosure in New South Wales/Australia (SEDA 1999).

Figure 3: Draft Standardized Label for Electricity Disclosure (example for Germany)

Electricity information				
Power product	ABC-Power			
Monthly electricity cost	for an annual consumption of			
	1.200 kWh	1.800 kWh	2.500 kWh	3.200 kWh
	e.g. single-person household	e.g. two-person household	e.g. three-person household	e.g. four-person household
	18,70 €	25,40 €	33,30 €	41,20 €
Contract details	minimum contract duration		price conditions	
	1 year		fixed price for min. duration	
Primary fuel mix	This product		Average Germany	
	The values presented for this product and the average for Germany both relate to the year 2001. The Renewable Energy Law obliges every supplier to buy at least 3,5 % of his electricity sales from renewable energy sources.		coal 50,3% nuclear power 30,3% natural gas 9,1% oil 0,7% renewables 6,3% <i>hydro power</i> 3,7% <i>wind power</i> 2,2% <i>biomass</i> 0,4% <i>solar power</i> 0,0% <i>other renewables</i> 0,0% other energy sources 3,2%	
	coal	60,0%	coal	50,3%
	nuclear power	25,0%	nuclear power	30,3%
	natural gas	5,5%	natural gas	9,1%
	oil	2,0%	oil	0,7%
	renewables	6,5%	renewables	6,3%
	<i>hydro power</i>	2,2%	<i>hydro power</i>	3,7%
	<i>wind power</i>	2,3%	<i>wind power</i>	2,2%
	<i>biomass</i>	1,8%	<i>biomass</i>	0,4%
	<i>solar power</i>	0,2%	<i>solar power</i>	0,0%
	<i>other renewables</i>	0,0%	<i>other renewables</i>	0,0%
	other energy sources	1,0%	other energy sources	3,2%
Environmental indicators				
			← better than average	worse than average →
Greenhouse gas emissions				107%
Sulphur and nitrogen oxides				104%
Radioactive waste				89%
			100%	= Average Germany

“Other energy sources“ are coalbed methane, coke gas, converter gas, and solid wastes.

How to Verify Electricity Product Characteristics?

Consumers might ask why change electricity suppliers if the power delivered to their homes physically will not change. It is clear that within the power supply system, the origin of electrons cannot be determined. Nevertheless, assigning power plants to single electricity offerings is possible by accounting for volumes of electricity fed into and taken from the system. In this way, imports and exports can be handled as well. The accounting can be performed best if it is used for all sources and sinks in the system, i.e., if the disclosure scheme is mandatory.

Basically there are two options to account for electricity sales:

- *Tracking the electricity contracts:* In this case, generation is assigned to the customers of different electricity offerings according to the contracts that have been concluded between power generators and suppliers. Or, to put it in another way: instead of electrons, the flows of money are tracked. This is quite easy in the case of bilateral contracts. But if electricity is traded through power exchanges or pools, a direct assignment of buyer and seller often is not possible. In this case, a solution would be to calculate the characteristics of the power pool average over a period of time and to assign this average to all electricity bought from the pool in that period.

- *Trading and tracking generation attributes, or certificates:* Here, the assignment of power generation to customers is completely separated from contracts on the power market. Instead, a separate market for certificates for power qualities is created. Each generator receives certificates for the power it has generated, which carry the information that is necessary for disclosure (fuel type, emissions, etc.). All suppliers are obliged to buy certificates for each kilowatt-hour they are selling to a final consumer. The trade of certificates between power generators and suppliers establishes market prices for different electricity, which in the end will correspond to the value of those attributes to final consumers.

Currently, both options are used in different US states and other countries with disclosure rules in place. It is not possible yet to make a clear recommendation which option would fit better into certain electricity markets, e.g. in Europe. This is the subject of ongoing research.

How to Deal with Imports?

Preferably, the introduction of electricity disclosure should be harmonized for all electricity transmitted via the UCTE¹¹ and its corresponding systems in Scandinavia and Great Britain. This is why any electricity disclosure initiative should be on the European level from the very beginning.

If Europe-wide harmonization is not possible, imports from countries without full disclosure should be assigned the respective residual average system mix.

Institutional Arrangements

The implementation of an electricity disclosure scheme has to meet the needs of a credible but pragmatic system. In line with the suggested Swiss organizational structure, the following allocation of responsibilities is recommended:

- Generators and suppliers account for the electricity generated and sold. They organize the relevant information structures themselves.
- Independent auditors verify and confirm the electricity balances once a year.
- A state organization (e.g., the regulatory body or a federal agency) reviews the procedures, authorizes the auditors and verifies the audits on a random basis. It also improves disclosure procedures if necessary. This organization is also responsible for the penalties in case of non-compliance with disclosure regulation.

For countries with a national transmission system operator, this organization should be given the charge to facilitate tracking and verification, because they have generation data already.

¹¹ UCTE (Union for the Co-ordination of Transmission of Electricity) is the umbrella organization of the West and Central European Transmission Grid operators.

6 Perspectives

As the largest share of electricity trading takes place on the European level, a disclosure scheme should be conceptualized for all European countries. This means that Germany, as well as other EU Member States, should develop national experiences and positions, and should input those into the European debate. If federal US legislation is passed requiring disclosure nationally, such legislation should take into account these same recommendations, but leaving to the states the authority to develop the implementation rules. We would recommend that tracking and verification systems be established at the regional transmission organization or independent system operator level.

Relevant recommendations for an electricity disclosure scheme are as follows:

- Disclosure should offer information regarding electricity costs (tariffs), the relevant contractual issues, the fuel mix, and environmental indicators (greenhouse gases, acid pollutants, and nuclear wastes).
- The information should refer to each electricity product offered by a supplier. In addition, data on the total supply should be made available in the internet.
- To achieve real transparency in the electricity market, disclosure rules must be mandatory for all suppliers.
- Disclosed information for customers should be offered in a standardized format (label) which is to be displayed on *all* printed promotional material such as brochures, letters, and print advertisements, and included with contractual material and electricity bills, and at supplier company web sites.
- In several countries and US States, procedures have been developed to “track“ electricity from various sources, and to deal with ex- and imports, as well as with power stock exchange. European countries should develop a consensus about the preferred method of tracking and verifying generation attributes, and how to display imports and exports.
- For undisclosed or doubtfully disclosed electricity imports, the average generation mix of the regional grid (Europe: UCTE) should be used.
- For Germany, electric utilities could implement a full disclosure scheme on their own, and would operate it in cooperation with independent auditors. An organization – private, state or otherwise – should be responsible to oversee the disclosure scheme, and review disclosed information.

Electricity disclosure is of high importance for electric utilities, consumer and environmental NGOs, governments, and democratic parties.

Öko-Institut invites all interested parties to further develop the concept of electricity disclosure, and to initiate a pilot phase for Germany. More information can be found at <http://www.oeko.de/service/stromlabel/>

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Appendix

Table A-1: Implemented Electricity Disclosure Schemes in US States

State	Disclosure rule since (Mandatory/Voluntary)	uniformity	environmental effects treated		reference to P= product, C= company portfolio
			generation mix	emissions	
AZ – Arizona	1999 required "to the extent reasonably known"	-	on request	on request	P
AR – Arkansas	2003 M	X	-	X	
CA – California	1999 M	X	X	(X)	P
CO – Colorado	1999 M	X	X	-	C
CT – Connecticut	2001 M	X	X	X	C
DE – Delaware	1999 M	-	X		P
DC - District of Columbia	2001 V		X		
FL – Florida	1999 M	-	X		
IL – Illinois	1999 M	X	X	CO ₂ , NO _x , SO ₂ , nuclear waste	C
ME – Maine	2000 M	X	X	CO ₂ , NO _x , SO ₂	P
MD - Maryland	2000 M	X	X	CO ₂ , NO _x , SO ₂	P
MA - Massachusetts	1998 M	X	X	CO ₂ , NO _x , SO ₂	C or P; if P, also C yearly
MI - Michigan	2002 M	X	X	CO ₂ , NO _x , SO ₂ , nuclear waste	P
MN - Minnesota	2002 M	X	X	emissions nuclear waste	
NJ – New Jersey	1999 M	X	X	CO ₂ , NO _x , SO ₂	P
NM – New Mexico	2006 M	X	X	CO ₂ , NO _x , SO ₂ , Hg, nuclear waste	
NY – New York	2002 M	X	X	CO ₂ , NO _x , SO ₂	
OH - Ohio	2001 M	X	X	CO ₂ , NO _x , SO ₂ , nuclear waste	P
OR - Oregon	2000 M	X	X	CO ₂ , NO _x , SO ₂ , nuclear waste	
PA - Pennsylvania	1998 available on request	X	on request		P
TX – Texas	2002 M	X	X	CO ₂ , NO _x , SO ₂ , particulates, nuclear waste	
VA - Virginia	2002 required "if it is feasible to submit data"		X	X	
WA - Washington	2001 M	X	X		P

Source: Markard/ Holt 2002