Renewable energy
and
green certificates.
Marketing and trading
experiences

Bioenergy workshop

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Today we face global environmental problems due to greenhouse gas emissions from fossil fuels

Three possibilities to secure a sustainable future development

1. Reduce energy consumption: Cut energy consumption and technical improvement to reduce need for energy
2. Use energy in a smarter way: Cogen and utilisation of best energy source for various purposes
3. Change to renewable energy sources: Stimulate demand/supply and develop cost efficient technologies to produce more and cheaper renewable energy

Enviro Energi's goal is to be a leading European company within trading and marketing of renewable energy and thereby contribute to effective mechanisms to connect producers and consumers of renewable energy, i.e. part of no. 3 above.

What is a green certificate

A green certificate, a Guarantee of Origin (GoO) according to EU RES-E Directive, is a documentation of production of renewable energy. Normally utilised to document the origin of electricity.

GoOs specify the energy source, give power plant information, specify the quantity and date of production and identify the body that issued the GoO. GoOs are the only proof of origin issued for the involved electricity and it is impossible to claim value of the origin more than once.

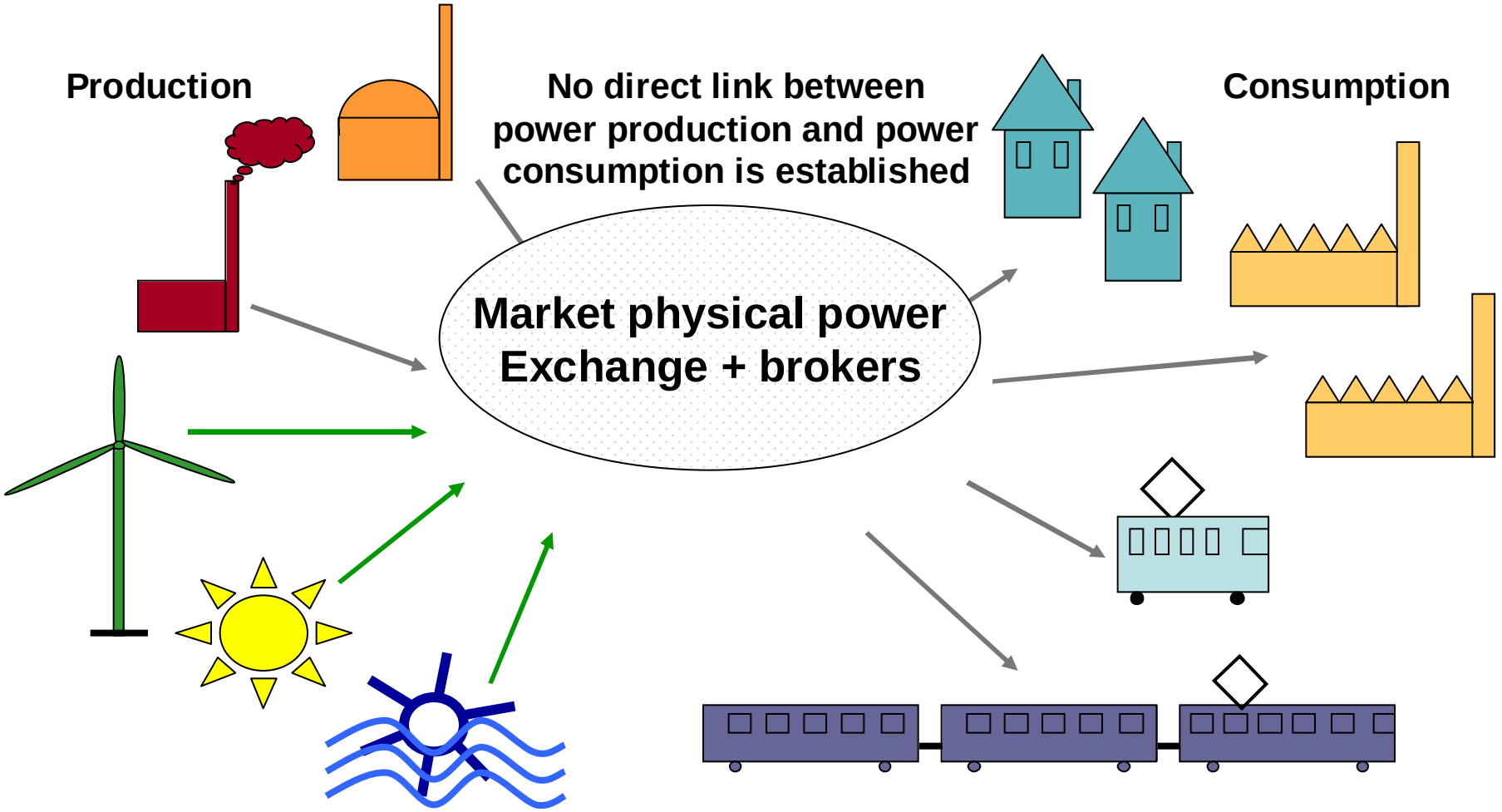
Co-firing of biomass and fossil fuels require statements documenting renewable and non-renewable volumes. Some more complicated and costly to handle.

The life cycle of the GoO consists of issuing (production), trading period and redemption (consumption).

Effective trading in an international markets requires harmonised and standardised systems. European RECS/EECS system is such a system opening the possibilities of a Pan-European market.

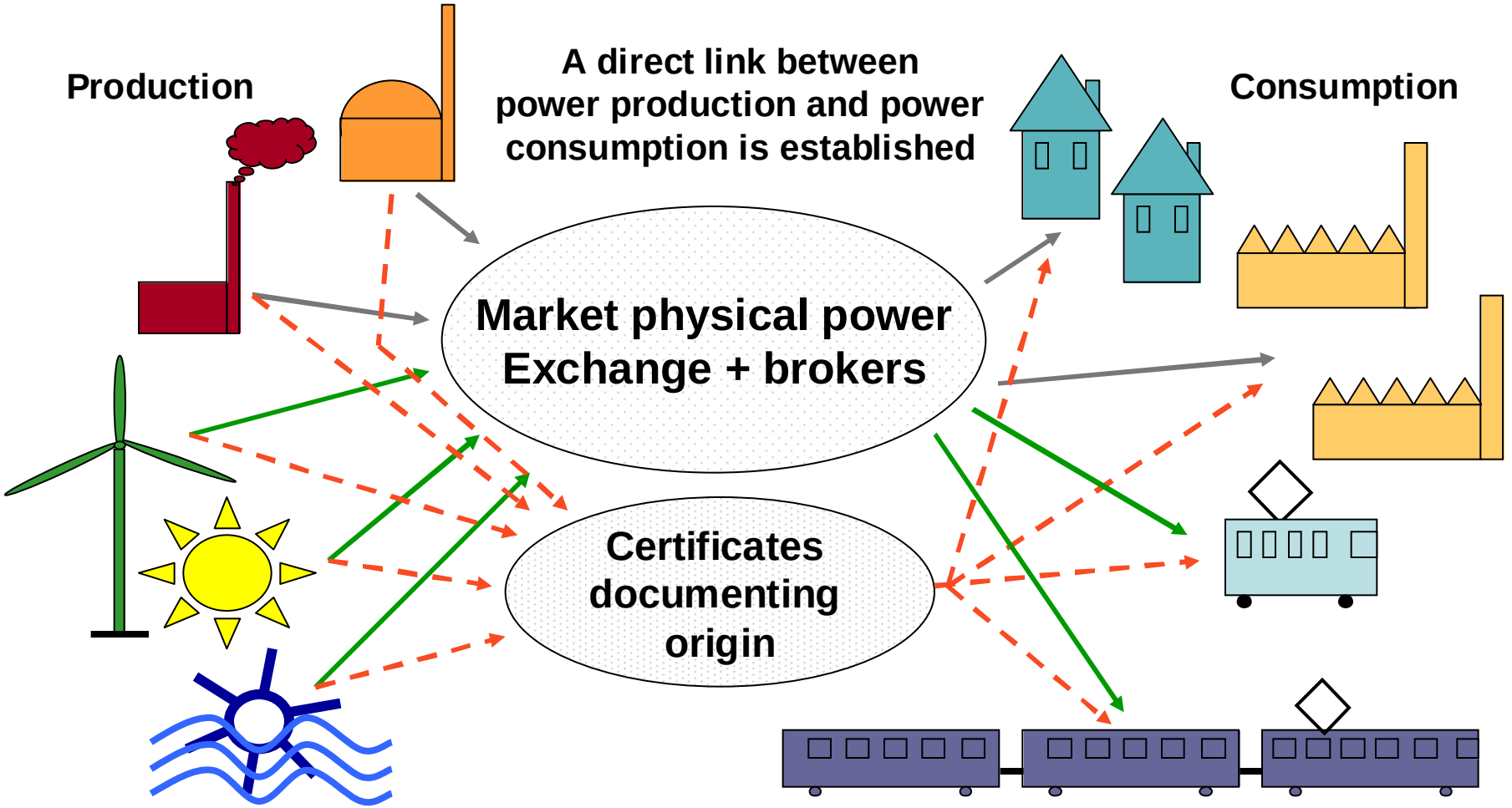
Main advantages are an cost effective system to document origin of energy and the possibility to trade GoOs separately from the physical electricity.

Supply of electricity without documentation of origin



Electricity is delivered to consumers as an unspecified electricity without any documentation showing how the actual electricity is porduced.

Supply of electricity with documentation of origin



Consumer receives documentation of origin showing that electricity to balance consumption is produced by specified energi sources and payments are directed towards selected power plants. Routines handeling physical electricity delivery are not influenced.

What market possibilities are opened with the help of a certificate systems

With the help of certificates documenting the origin of electricity it is possible to design electricity products where consumers demand are directed towards electricity from special power plants.

Certificates documenting the origin are also used as documentation when electricity suppliers prepare their fuel-mix disclosure to their customers. This is an EU/EEA requirement according to the electricity market directive.

Customer demand can be voluntary (the customer wants to buy the special product) or it could be a more or less compulsory demand by the consumer (obligation to buy or some sort of tax incentive).

Voluntary demand for electricity products including documentation of origin

There are three main categories of customers that on a voluntary basis want to buy “green” energy products:

1: Companies taking their social responsibility seriously
- Environmental strategies, CSR-Reports
- To attract new investors (DJSI indexes, FTSE4Good indexes)
- To attract new customers

2: Public sector companies
- Early adopters of environmentally good products. Focus has increased as a result of the fuel-mix disclosure to be published by EU/EEA electricity suppliers.

3: Environmentally concerned households

NGOs function as watch dogs, NGO Eugene-standard basis for many environmentally friendly electricity products. Increased demand for renewable energy increase the value and thereby stimulate more production.

Compulsory demand for electricity products including documentation of origin

There are two main categories of customers that on a compulsory basis buy “green” energy products:

1: Consumers utilising tax advantages linked to consumption of renewable energy. One example is the UK LEC-scheme reducing the electricity taxation of companies buying renewable electricity.

2: Consumers that through a legal obligation are forced to buy electricity from renewable sources. One example is the Italian Green Certificate system introducing a quota obligation that force all electricity suppliers to deliver a certain percentage of the electricity from new power plants based on renewable energy sources.

Both tax advantages and quota obligations increase the demand for and value of renewable energy and thereby stimulate more production. Demand based on compulsory schemes normally give larger stimulation to new investments than voluntary demand.

Value of certificates documenting origin of electricity

Values linked to voluntary demand are related to consumers' willingness to pay extra for renewable energy. Highest value for certificates giving electricity eligible for various NGO green labels.

Values linked to tax-reductions are related to size of tax advantage

Values linked to quota obligations are linked to difference between production cost and market value of electricity.

Possible to combine different attributes into same certificate, but also possible to issue separate certificates for separate attributes.

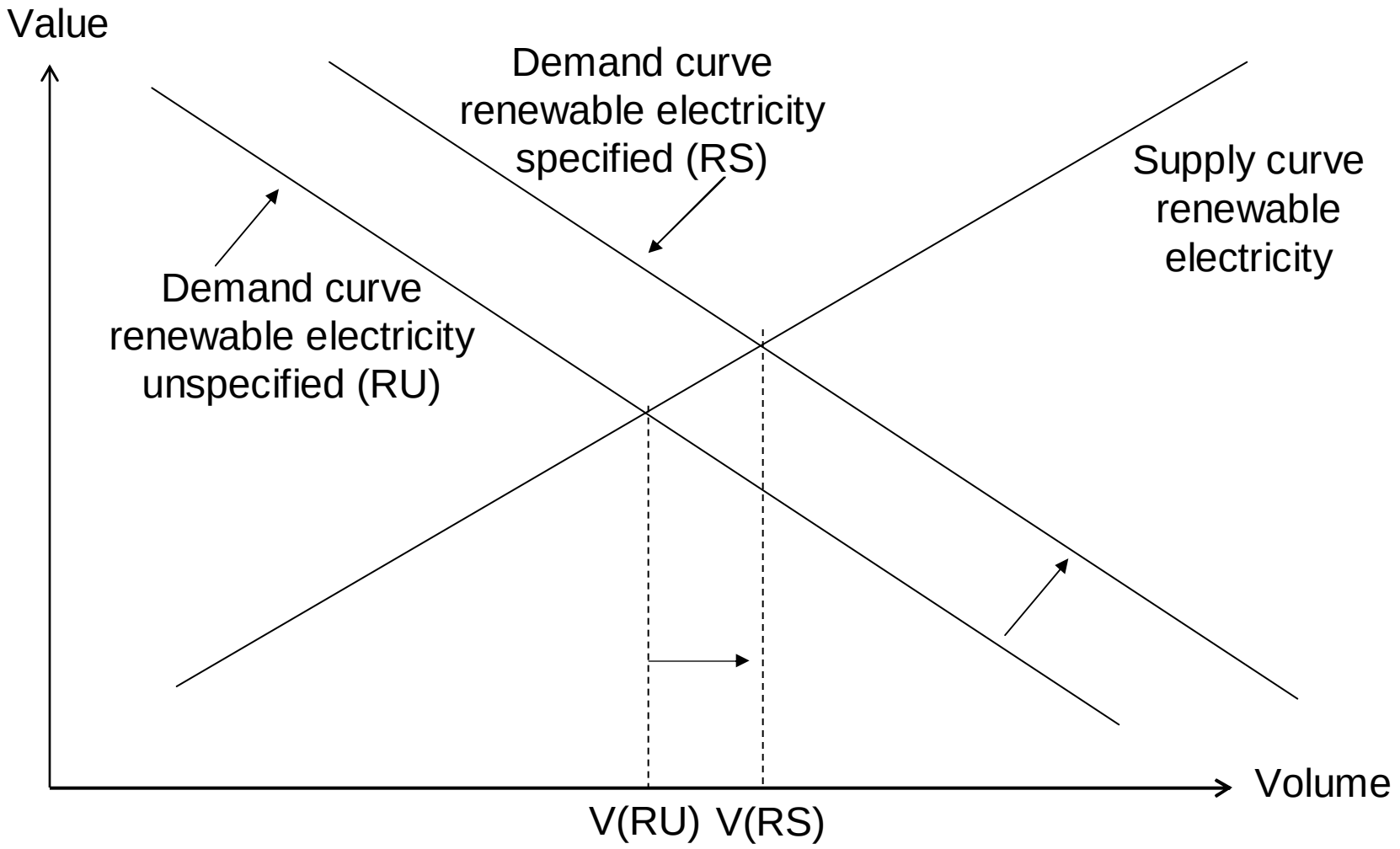
Supply of renewable electricity in the form of Guarantees of Origin

Guarantees of Origin to cover the voluntary demand are mainly delivered by power companies producing electricity from hydro power, but also wind and biomass cover part of the demand. To fulfil requirements from NGOs and the Eugene-standard new power plants and power plants fulfilling special criterions are extra attractive.

Compulsory demand is covered by companies operating power plants eligible for the tax-relief or quota obligation. Many new power producing companies have been established.
Normal requirements to be eligible are: New project, sometimes a maximum production capacity, sometimes a defined technology and normally situated within the national borders of the country operating the tax or quota obligation scheme.

Both voluntary and compulsory demand contribute to increased value and thereby stimulate new investments.

Result of increase in demand for renewable energy when documentation of origin is introduced



One example, ranking of Belgian electricity suppliers done by Greenpeace

GREENPEACE

Leveranciers	Energiemix	Investeringsbeleid	Energiediensten	Totale score
Nuon Nature	++	++	++	200
Ecopower *	++	++	+	175
City Power Belgisch Groen	++	++	+/-	150
Essent Groene Stroom	++	+/-	+/-	100
EBEM - Elektriciteitsbedrijf Merksplas **	+/-	++	++	100
Nuon	+/-	+/-	++	50
City Power	+/-	+	+/-	25
Eneco Energie	+/-	+/-	+	25
SPE ***	+/-	+	+/-	25
Essent	+/-	+/-	+/-	0
Luminus	-	+/-	++	0
EDF Belgium ***	--	-	+/-	-125
Electrabel Customer Solutions	--	--	+	-125
E.on Belgium ***	--	--	+/-	-150

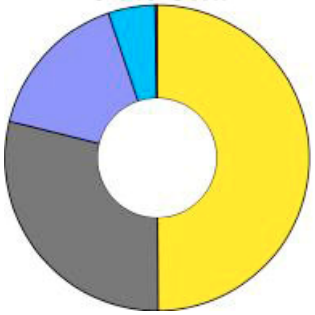
One example, fuel-mix disclosure for electricity and heat prepared by Helsinki Energia, Finland

Fuel-mix for our supply in 2003
Helsinki Energia annually prepare a fuel-mix disclosure for delivered electricity and heat including some environmental figures related to the production.

Helsinki Energia's environmental fiures 2003:

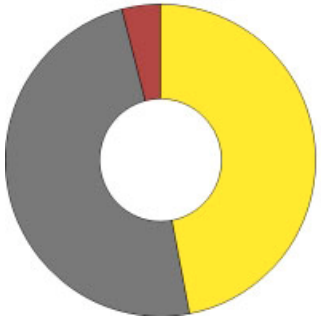
	2003	2002
CO2 (g/kWh)	330	290
SO2 (mg/kWh)	350	250
NO (mg/kWh)	400	370
Particles (mg/kWh)	40	20
Nuclear waste (mg/kWh)	0.5	0.5

Eltillförseln
9 149 GWh



Energikällor	%	CHP, %
Naturgas	50	80
Stenkol	29	60
Kärnkraft	16	
Vattenkraft	5	
Olja	0,2	
Vindkraft	0,03	

Fjärrvärmetillförseln
7 494 GWh



Energikällor	%	CHP, %
Naturgas	47	96
Stenkol	49	93
Olja	4	

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