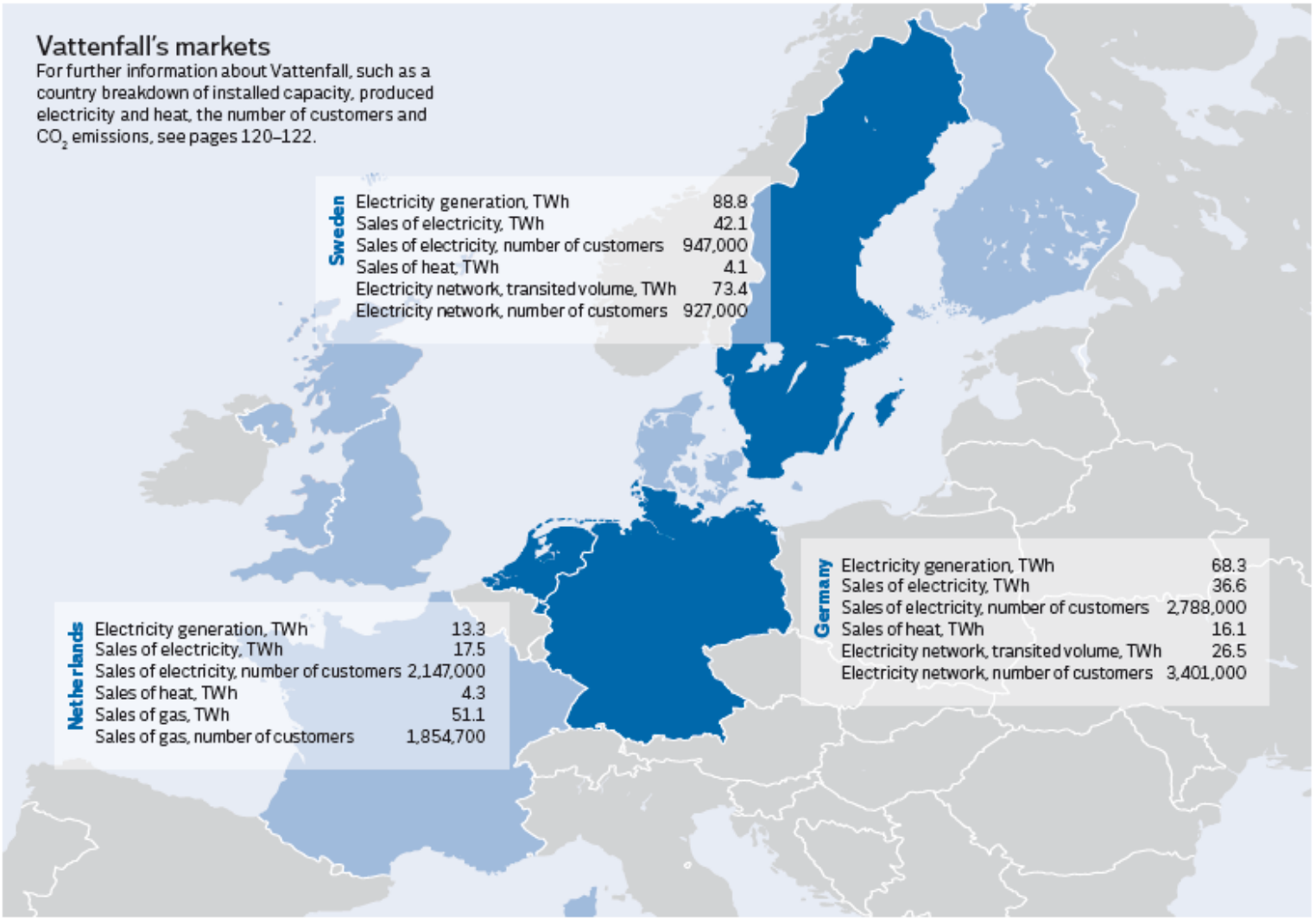
All about Allowances: How to manage, surrender, and capitalize

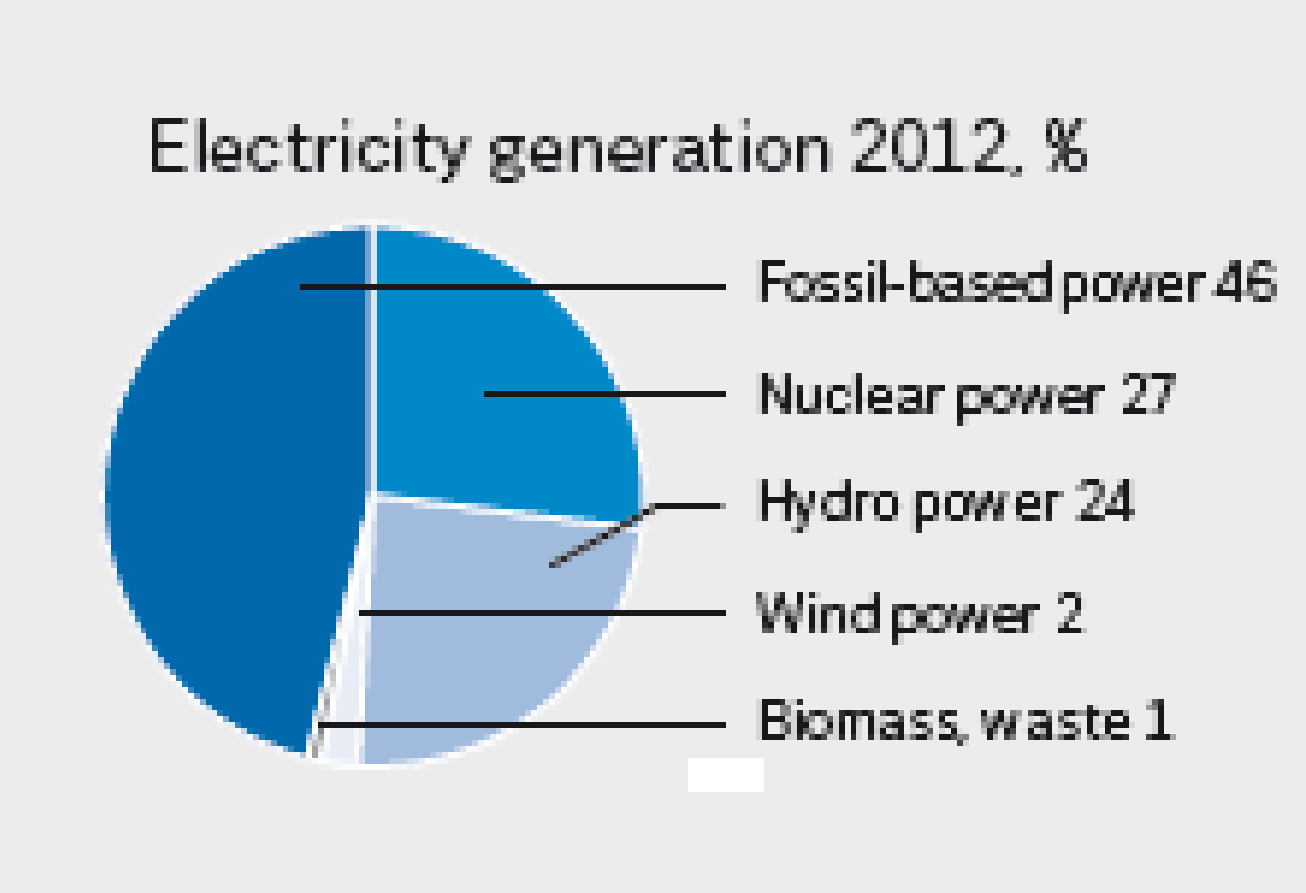
Francisco Grajales
Regional Manager
Global Emissions
Vattenfall Energy Trading Netherlands N.V.
23/10/2013

VATTENFALL

Vattenfall at a glance

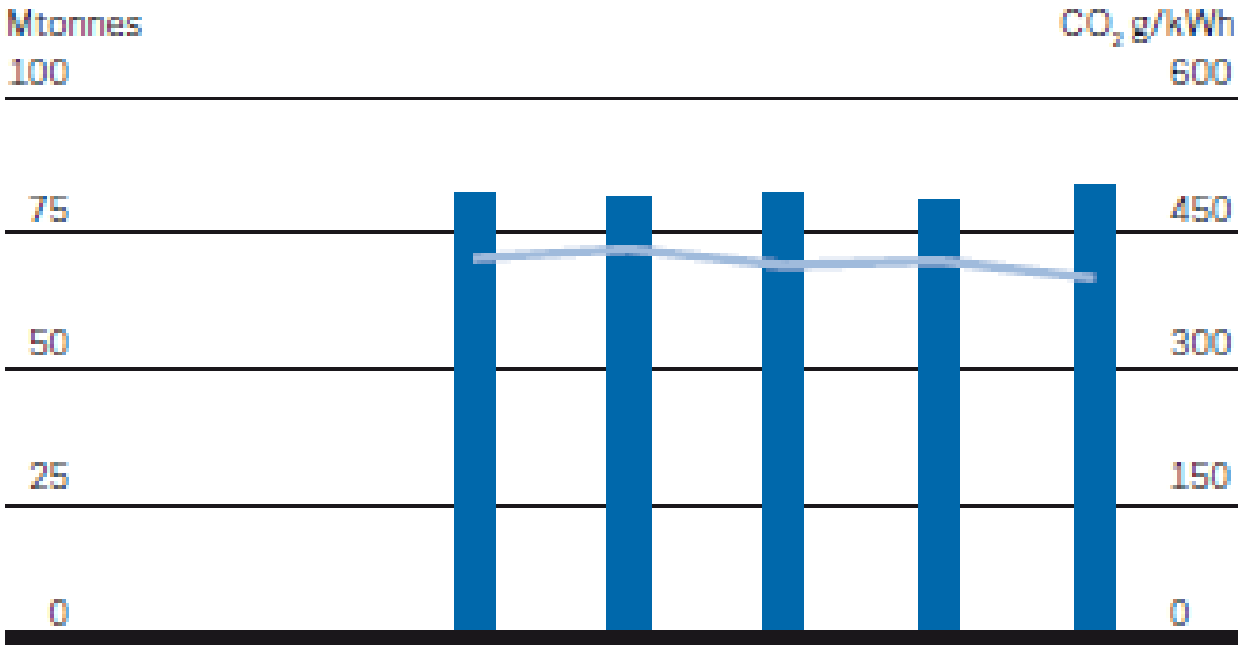


Vattenfall Energy Mix



Vattenfall Energy Mix

CO_2 emissions per year (total and specific, consolidated)[1]



TWh	2008	2009	2010	2011	2012
CO_2 Mtonnes	82.6	81.8	82.4	80.6	83.5
CO_2 g/kWh[2]	422	432	414	419	400

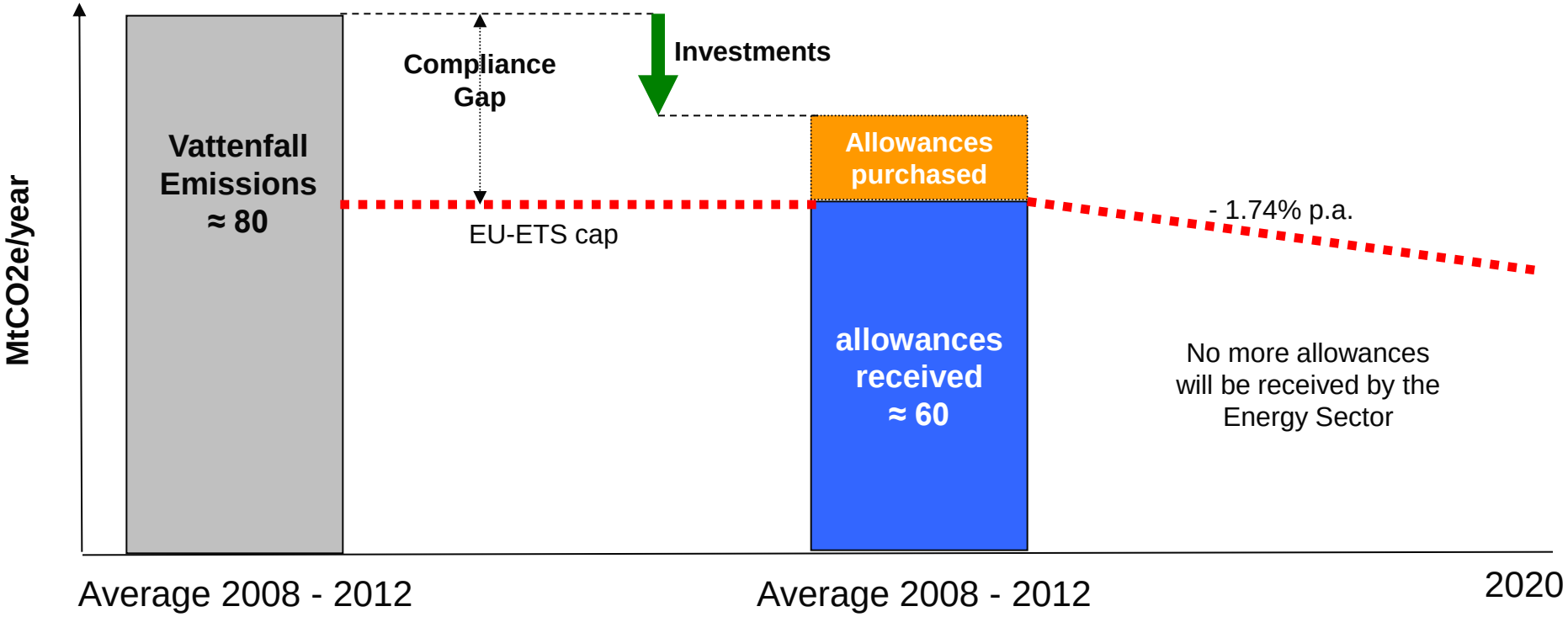
Policy options for controlling GHG emissions

Policy Instrument	Advantages	Disadvantages
Cap and Trade	- Cost effective - Provides flexibility and certainty - Goal is clear and normally long term - Favored by majority of business community - Easy to hedge, cost lock in.	- Setting the right cap might be challenging - Complex management and enforcement - Carbon leakage
Carbon Tax	- Clear price indication - Easy to understand and explain - Certainty of the revenue for the state	- Public aversion to taxes - Determining the proper tax level - Taxes are changed by politicians. - Uncertain effects - Very rigid - Carbon leakage
Direct Regulation	- Can bring prompt results - Can be easy to understand - Easy to enforce	- Very complex to set standards for different activities - Not flexible - Expensive to monitor and control - Carbon leakage

Compliance under a Cap and Trade System

Strategic options for compliance:

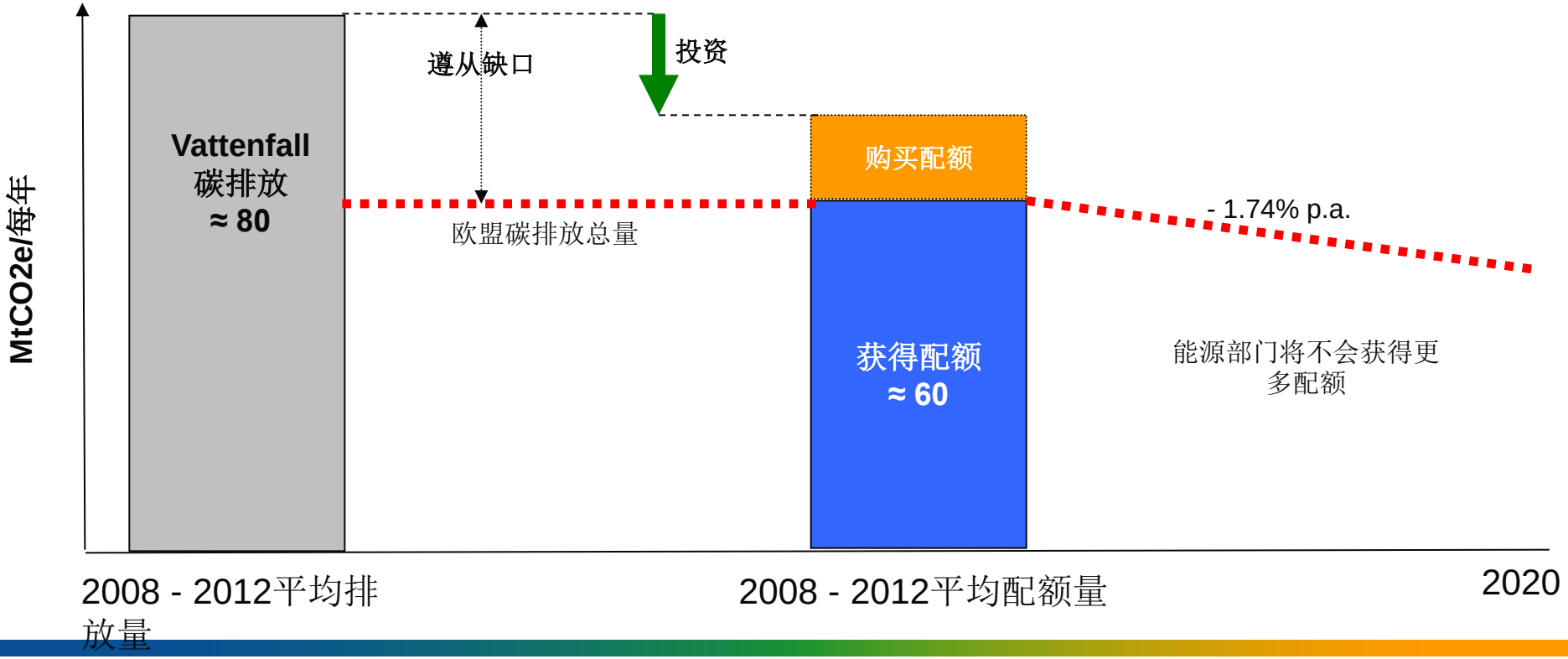
- Increase share of clean technologies in generation mix (decrease emissions)
- Acquire more EUAs (increase allowances)
- Participate in CDM activities(increase allowances)



总量管制与交易制度的合规情况

减排承诺指标的战略选择：

- 尽可能增加清洁技术在发电结构中的份额（降低排放量）
- 获取更多欧盟配额（增加配额）
- 参加清洁发展机制活动（增加配额）



Carbon Allowances Management

- Types of allowances:
  - Inherent to a cap and trade system (EUA's for the EU-ETS)
  - From project offsets (CERs and ERUs)

- The main objectives of managing allowances properly are:
  - Minimizing compliance costs
  - Efficient hedging of power sales
  - Revenue source

碳配额管理

- 配额类型：
  - 总量管制和交易制度下的固有配额（欧盟碳排放配额）
  - 计划抵消的配额（**核**证减排额和减排单位）

- 正确管理配额的主要目的：
  - 降低合规成本
  - 有效对冲电力销售
  - 收入来源

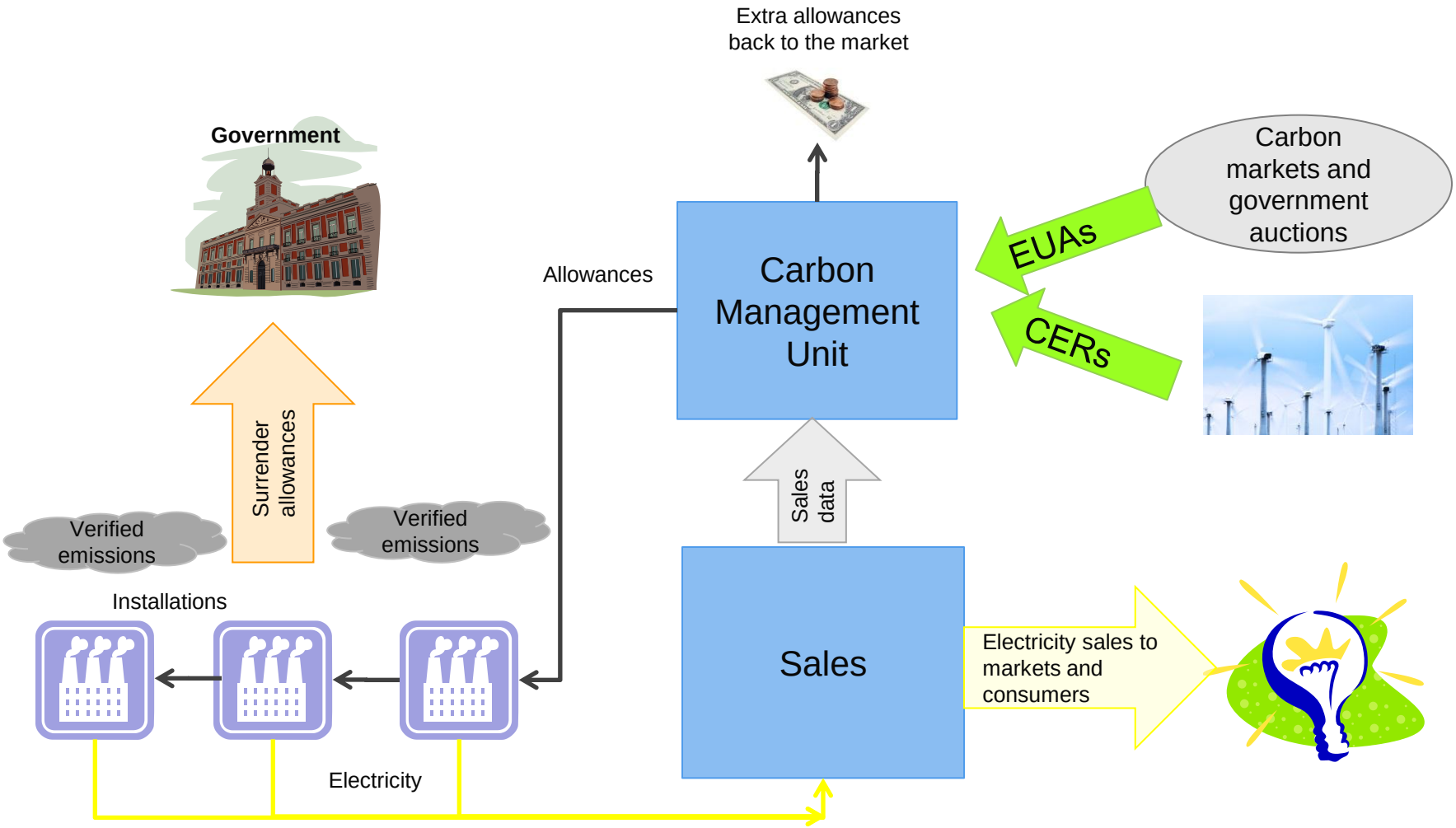
Carbon Allowances Management

- Each individual installation monitors and reports GHG emissions on a yearly basis
- … but allowances are managed centrally / optimization
- Central management of allowances is done nearly on a daily basis (particular case of a large power company with several plants)
- Compliance is done again at the installation level (surrendering)

碳配额管理

- 每个排放点每年都需要监管和上报温室气体排放量
- 但配额管理相对集中/优化
- 几乎每天进行配额的集中管理（尤其是拥有好几个发电厂的大型电力公司）
- 在排放点环节再次完成减排承诺指标（退回碳配额）

Carbon Allowances Management



Carbon Allowances Management

- Access to allowances can be achieved through:
  - Government handouts (EUAs)
  - Government auctions (EUAs)
  - Carbon exchanges (EUAs and CERs)
  - Bilateral purchases (EUAs and CERs)

碳配额管理

- 获取碳配额的途径:
  - 政府发放（欧盟配额）
  - 政府拍卖（欧盟配额）
  - 碳交换（欧盟配额 和核证减排额）
  - 双边互买（欧盟配额 和核证减排额）

Carbon Allowances Management

- The optimal mix of allowances for compliance/hedging is determined by several factors
  - Cost
  - Availability
  - Time
  - ETS restrictions i.e. EU allows only x% of CERs to be used for compliance
- In the case of the EU-ETS compliance has to be achieved by April each year

碳配额管理

- 最佳减排承诺或限制配额组合由以下几个要素决定：
  - 成本
  - 可行性
  - 时间
  - 碳交易制度限制，例如， 欧盟仅允许使用X%的核证减排额
- 欧盟碳排放交易体系减排承诺指标于每年四月份达成

Example – Main Assumptions

Each December Government allocates 200 EUAs at no cost	Maximum use of offsets: 20% of emissions in compliance year
Compliance deadline by 1Q of every year	Original emissions factor: 0.400 tCO2/MWh
New wind park enters operation in January 2014	500 CERs coming from an offset project are expected in January 2015
Initial CER, EUA position: 0	EUA prices are higher than CER prices

实例——主要设想

每年十月份政府免费发放200个欧盟配额	最大限度利用抵消交易：减排承诺执行年份占20%的碳排放额
减排承诺截止期为每年的第一个季度	原始碳排放量：0.400 tCO2/MWh
2014年1月新型风力涡轮机投入使用	预计2015年有500核证减排额来自抵消交易项目
初始核证减排额，欧盟配额标准：0	欧盟配额价格高于核证减排价格

EXAMPLE - 2013

- On 2Q, 2013 sales data are:
  - 1,000 MWh sold forward into 2Q 2014
  - 1,000 MWh sold spot
- Total emissions in 2013: 400 tCO2
- Up to 80 CERs can be used for 2013 compliance

	1Q 2013	2Q 2013	3Q 2013	4Q 2013
Sales future (MWh)				
Sales spot (MWh)		1,000		
EF (tCO2/MWh)		0.400	0.400	0.400
Emissions (tCO2)		400		
Hedging needs (allowances)		400		
Total need of allowances	**-**	**800**	**-**	**-**

MANAGEMENT OF ALLOWANCES				
Free EUA allocation	-	-	-	200
Compliance EUAs	-	-	-	-
Compliance CERs	-	-	-	-
Purchase EUAs	-	520	-	-
Purchase CERs		80	-	-
Sales EUAs	-	-	-	-
Sales CERs	-	-	-	-
Offset CERs				
EUA account	**-**	**520**	**520**	**720**
CER account	**-**	**80**	**80**	**80**

实例 - 2013

- 2013年第二季度交易数据：
  - 交易量1,000 MWh，直到2014年第二季度
  - 现货交易量1,000 MWh
- 2013年总排放量： 400 tCO2
- 2013减排承诺指标可用核证减排额达到80

	1Q 2013	2Q 2013	3Q 2013	4Q 2013
Sales future (MWh)				
Sales spot (MWh)		1,000		
EF (tCO2/MWh)		0.400	0.400	0.400
Emissions (tCO2)		400		
Hedging needs (allowances)		400		
Total need of allowances	**-**	**800**	**-**	**-**

MANAGEMENT OF ALLOWANCES				
Free EUA allocation	-	-	-	200
Compliance EUAs	-	-	-	-
Compliance CERs	-	-	-	-
Purchase EUAs	-	520	-	-
Purchase CERs		80	-	-
Sales EUAs	-	-	-	-
Sales CERs	-	-	-	-
Offset CERs				
EUA account	**-**	**520**	**520**	**720**
CER account	**-**	**80**	**80**	**80**

Example - 2014

- The emissions factor is affected and reduced to 0.300 tCO2/MWh
- On 2Q, 2014 sales data are:
  - 2,000 MWh sold forward into 2Q 2015
  - 1,000 MWh sold spot
- Total emissions in 2014: 600 tCO2
- Up to 120 CERs can be used for 2014 compliance

	1Q 2014	2Q 2014	3Q 2014	4Q 2014
Sales future (MWh)		1,000		
Sales spot (MWh)		1,000		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		600		
Hedging needs (allowances)		600		
Total need of allowances		**1,200**		

	MANAGEMENT OF ALLOWANCES			
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-320	-	-	-
-	Compliance CERs	-80	-	-	-
-	Purchase EUAs	-	480	-	-
-	Purchase CERs	-	120	-	-
-	Sales EUAs	-	-	-	-
-	Sales CERs	-	-	-	-
	Offset CERs	-	-	-	-
720	**EUA account**	**400**	**880**	**880**	**1,080**
80	**CER account**	**-**	**120**	**120**	**120**

Example - 2014

- 碳排放量受到影响，降低到0.300 tCO2/MWh
- 2014年第二季度交易数据：
  - 交易量2,000 MWh，直到2015第二季度
  - 现货交易量1,000 MWh
- 2014年碳排放总量：600 tCO2
- 2014减排承诺指标可用核证减排额达到120

	1Q 2014	2Q 2014	3Q 2014	4Q 2014
Sales future (MWh)		1,000		
Sales spot (MWh)		1,000		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		600		
Hedging needs (allowances)		600		
Total need of allowances		**1,200**		

	MANAGEMENT OF ALLOWANCES				
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-320	-	-	-
-	Compliance CERs	-80	-	-	-
-	Purchase EUAs	-	480	-	-
-	Purchase CERs	-	120	-	-
-	Sales EUAs	-	-	-	-
-	Sales CERs	-	-	-	-
	Offset CERs	-	-	-	-
720	**EUA account**	**400**	**880**	**880**	**1,080**
80	**CER account**	**-**	**120**	**120**	**120**

Example - 2015

- On 2Q, 2015 sales data are:
  - 0 MWh sold forward into 2016
  - 3,000 MWh sold spot
- Total emissions in 2015: 1500 tCO2
- Up to 300 CERs can be used for 2015 compliance
- Since the company holds a substantial excess of CERs, 180 CERs are sold in December 2015.

	1Q 2015	2Q 2015	3Q 2015	4Q 2015
Sales future (MWh)		2,000		
Sales spot (MWh)		3,000		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		1,500		
Hedging needs (allowances)		-		
Total need of allowances		**1,500**		

	MANAGEMENT OF ALLOWANCES				
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-480	-	-	-
-	Compliance CERs	-120	-	-	-
-	Purchase EUAs	-	400	-	-
-	Purchase CERs	-	-	-	-
-	Sales EUAs	-	-	-	-
-	Sales CERs	-	-	-	-180
-	Offset CERs	500	-	-	-
1,080	**EUA account**	**600**	**1,000**	**1,000**	**1,200**
120	**CER account**	**500**	**500**	**500**	**320**

实例 - 2015

- 2015年第二季度交易数据：
  - 交易量0 MWh，直到**2016年第二季度**
  - 现货交易量3,000 MWh
- 2015年碳排放总量： 1500 tCO2
- 2015减排承诺指标可用核证减排额达到300
- 由于公司持有大量额外核证减排额，2015年10月核证减排额交易达到180。

	1Q 2015	2Q 2015	3Q 2015	4Q 2015
Sales future (MWh)		2,000		
Sales spot (MWh)		3,000		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		1,500		
Hedging needs (allowances)		-		
Total need of allowances		**1,500**		

	MANAGEMENT OF ALLOWANCES				
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-480	-	-	-
-	Compliance CERs	-120	-	-	-
-	Purchase EUAs	-	400	-	-
-	Purchase CERs	-	-	-	-
-	Sales EUAs	-	-	-	-
-	Sales CERs	-	-	-	-180
-	Offset CERs	500	-	-	-
1,080	**EUA account**	**600**	**1,000**	**1,000**	**1,200**
120	**CER account**	**500**	**500**	**500**	**320**

Example - 216

- On 2Q, 2016 sales data are:
  - 0 MWh sold forward into July 2016
  - 500 MWh sold spot
- Total emissions in 2016: 150 tCO2
- Up to 30 CERs can be used for compliance in 2016, so 10 CERs are bought
- Since the company holds a substantial excess of EUAs, 50 EUAs are sold in 3Q 2015.

	1Q 2016	2Q 2016	3Q 2016	4Q 2016
Sales future (MWh)		-		
Sales spot (MWh)		500		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		150		
Hedging needs (allowances)		-		
Total need of allowances		**150**		

	MANAGEMENT OF ALLOWANCES			
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-1,200	-	-	-
-	Compliance CERs	-300	-	-	-
-	Purchase EUAs	-	-	-	-
-	Purchase CERs	-	10	-	-
-	Sales EUAs	-	-	-50	-
-180	Sales CERs	-	-	-	-
-	Offset CERs	-	-	-	-
1,200	**EUA account**	**-**	**-**	**- 50**	**150**
320	**CER account**	**20**	**30**	**30**	**30**

实例 - 2016

- 2016年第二季度交易数据：
  - 交易量0 MWh，直到2016年7月
  - 现货交易量500 MWh
- 2016年碳排放总量：150 tCO2
- 年排放承诺可用核证减排额达到30，所以2016年有10个核证碳减排额买入。
- 由于公司持有大量额外欧盟配额，2015年第三季度有50的欧盟配额卖出。

	1Q 2016	2Q 2016	3Q 2016	4Q 2016
Sales future (MWh)		-		
Sales spot (MWh)		500		
EF (tCO2/MWh)	0.300	0.300	0.300	0.300
Emissions (tCO2)		150		
Hedging needs (allowances)		-		
Total need of allowances		**150**		

	MANAGEMENT OF ALLOWANCES			
200	Free EUA allocation	-	-	-	200
-	Compliance EUAs	-1,200	-	-	-
-	Compliance CERs	-300	-	-	-
-	Purchase EUAs	-	-	-	-
-	Purchase CERs	-	10	-	-
-	Sales EUAs	-	-	-50	-
-180	Sales CERs	-	-	-	-
-	Offset CERs	-	-	-	-
1,200	**EUA account**	**-**	**-**	**- 50**	**150**
320	**CER account**	**20**	**30**	**30**	**30**

Monetizing Allowances

Spot	▪ Selling in an exchange/market or to a counterparty for immediate delivery. The allowance has to be already issued.
Futures	▪ Selling on an exchange/market or to a counterparty for guaranteed delivery in the future. ▪ In the EU-ETS the most common future delivery is December of each year ▪ The allowance doesn't need necessarily to be issued at the moment of selling a futures contract.
Options	▪ Is a contract that gives the owner the right but not the obligation to buy or sell an allowance at a specific price. It is mainly used for hedging purposes. Right to buy is a call, right to sell is a put. ▪ Options have expiry dates ▪ For example if a company has a substantial volume of allowances but wants to save them for future use and is worry about the price going down substantially, then the company can buy a put option at a lower price than whatever price is current at the moment of purchasing the option.
Swaps	▪ Physical swap is the exchange of different types of allowances by two different parties. For example EUAs for CERs or vice versa with or without cash transfers.
Spreads	▪ A contract which reflects the price differential between allowances of different future delivery dates.

THANK YOU!

Francisco Grajales Cravioto
Regional Manager / Global Emissions
Vattenfall Energy Trading Netherlands N.V.
Asset Optimisation and Trading
Vattenfall Carbon Fund
T +31 880985455
M +31 655872128
E francisco.grajales@vattenfall.com
www.vattenfall.com