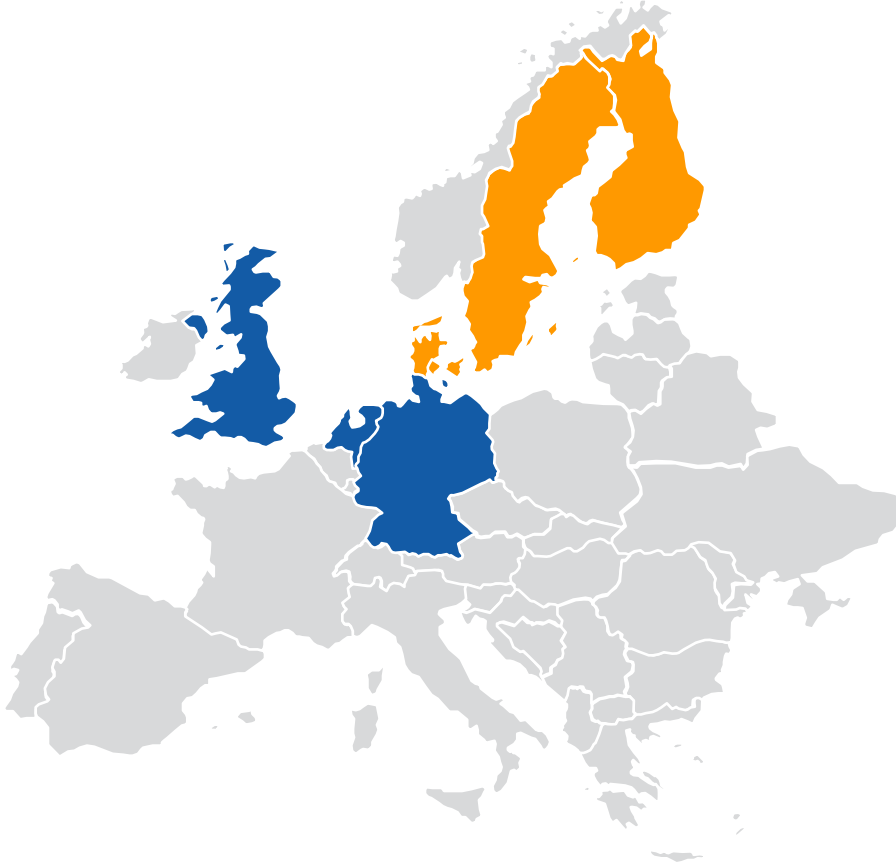


All about Allowances: from a power company perspective

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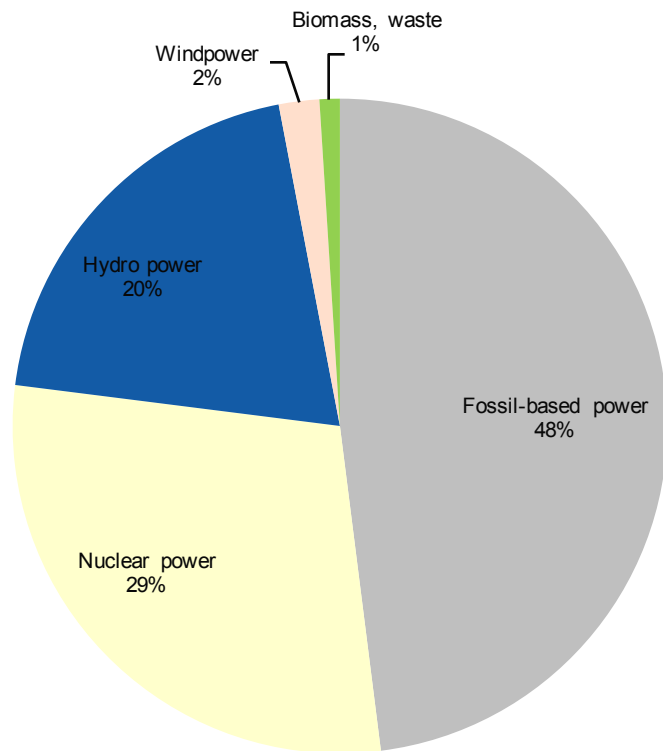
This is Vattenfall



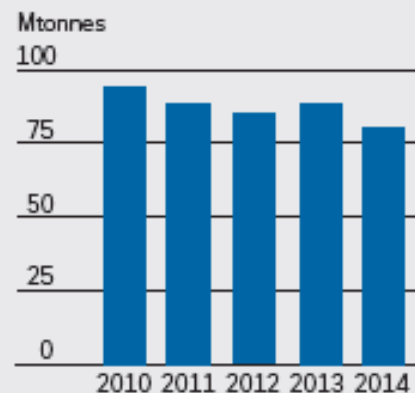
- One of Europe's largest electricity producers
- 100%-owned by the Swedish state
- Main markets:
Nordic countries, Germany, Netherlands
- Vattenfall also has operations in:
UK (mainly within wind power)
- Main products:
Electricity, Heat, Gas, Emission Allowances
- Operations span the entire energy value chain:
Production, Distribution, Trading, Sales and Energy Solutions

Vattenfall's Energy Mix and CO₂ emissions

Electricity Generation 2014, %



CO₂ exposure



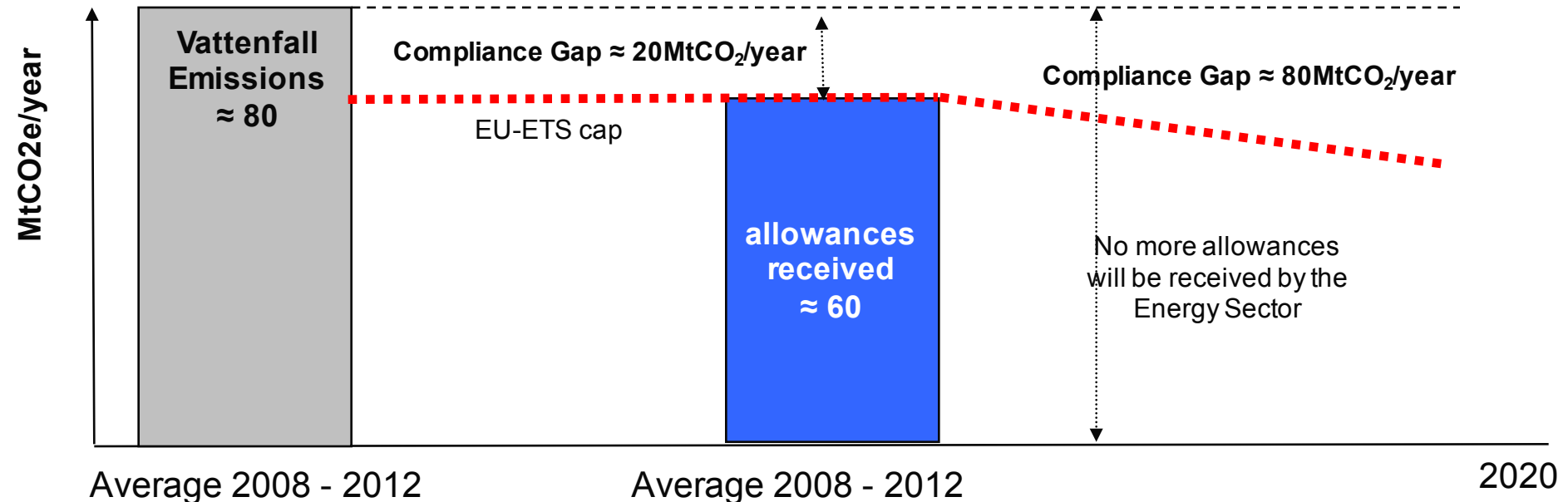
Total CO₂ emissions 2010–2014. Emissions are reported on a pro rata basis corresponding to Vattenfall's share of ownership in the respective plants.

	2010	2011	2012	2013	2014
CO ₂ Mtonnes	93.7	88.6	85.0	88.4	82.3

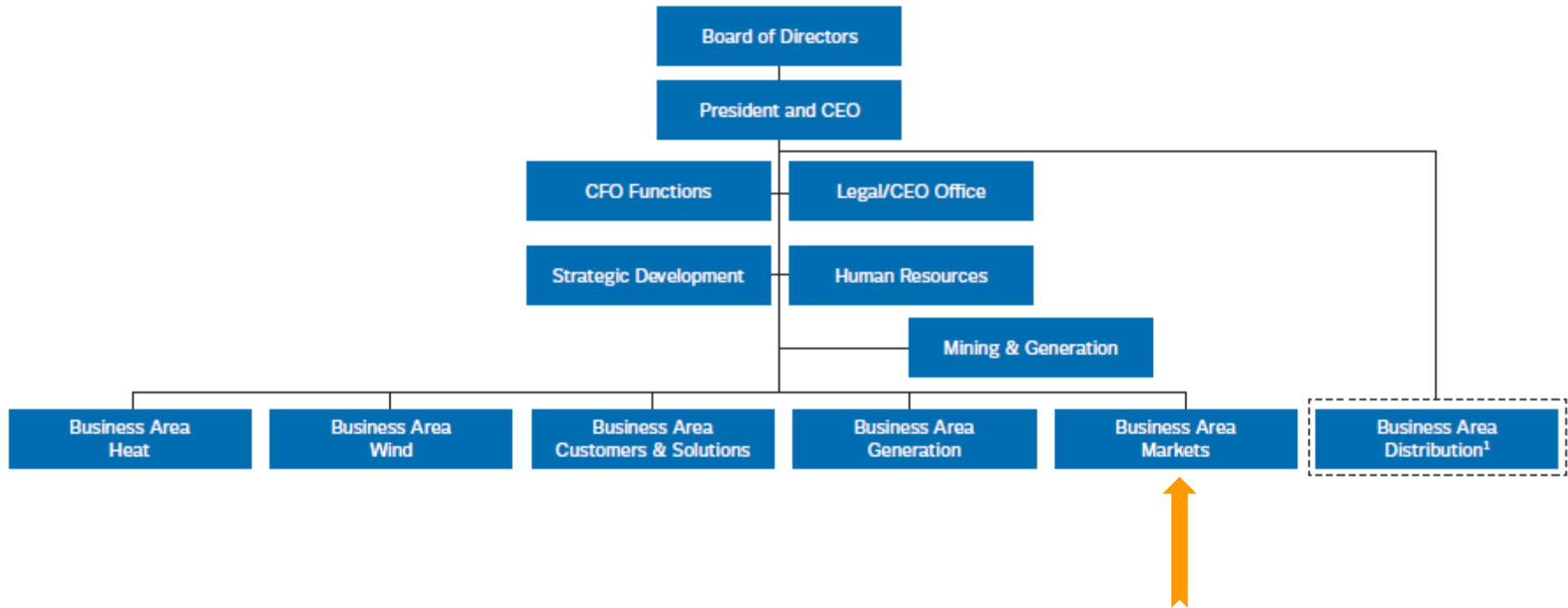
Vattenfall's carbon exposure

Economic Exposure / Potential Liability

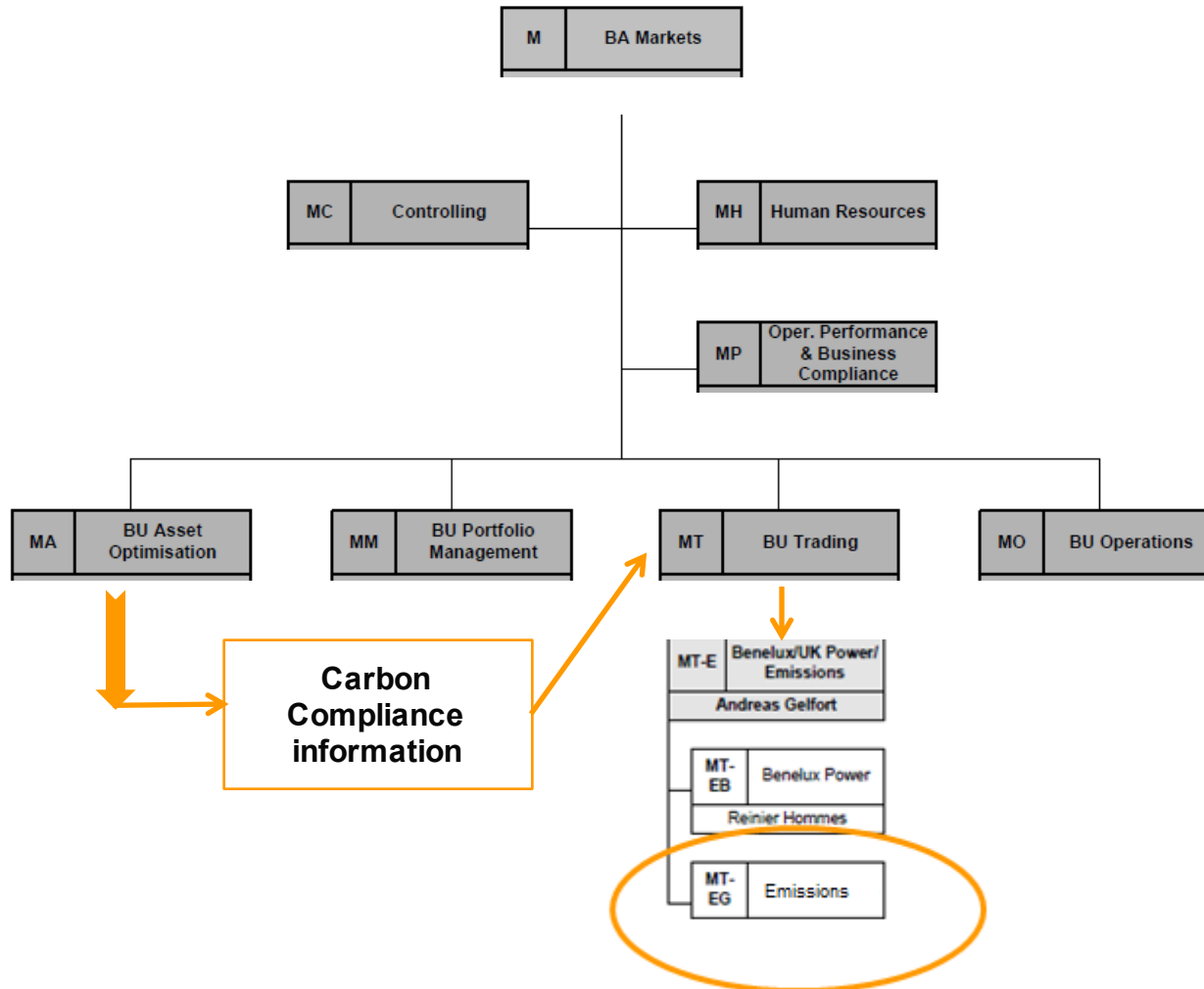
- 2008-2012 Vattenfall short by 20 MtCO₂ per year
- In 2008, average expected cost of carbon allowances = €10/tCO₂
- Therefore, compliance cost estimated to be in the range of **€200 M. per year until 2012.**
- After 2012, no more allowances are received for free. Compliance gap will be around 80 MtCO₂ per year (if no actions are taken) with a potential liability of **€800 M. per year.**



Vattenfall's Organization



BA Markets



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 in EU-ETS, CCERs in China)

➤ Access to allowances can be achieved through:

- Government handouts (EUAs)
- Government auctions (EUAs)
- Carbon exchanges (EUAs and CERs)
- Bilateral purchases (EUAs and CERs)

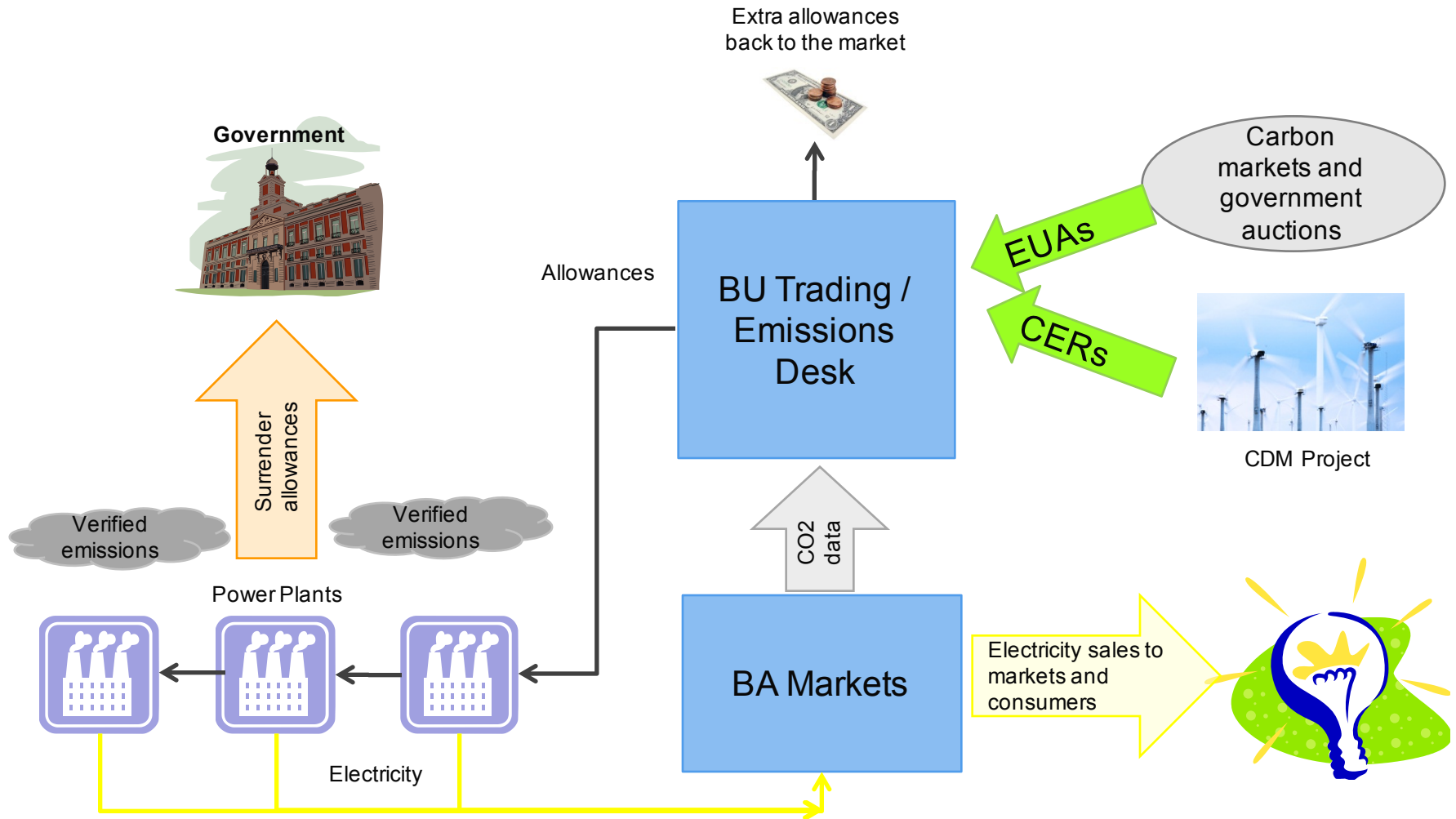
➤ The main objectives of managing allowances properly are:

- Minimizing compliance costs
- Efficient hedging of power sales
- Revenue source

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)

Allowances Management in Vattenfall



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

Lessons learned

- Determine your carbon exposure before anything else
- The best carbon management strategy is the one that will provide the company with certainty and lower compliance costs than the competition
- Nobody can exactly predict the direction of carbon prices in the future.
- Very important to assign clear roles and responsibilities within different units linked to carbon, to avoid unnecessary conflicts and costs.
- Do not wait until the last day for compliance! It will be risky and most likely expensive.

THANK YOU!

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