

Legislation in the EU and the impact on existing plant

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Current EU legislation

- **EU countries comply with UN, EC and other international protocols by adopting these into national legislation**
- **Individual member states may set their own national legislation**
- **All member states must comply with EC Directives, although derogations may be permitted**
- **Three main Directives:**
 - **IPPC** – **Integrated Pollution Prevention and Control**
 - **LCPD** – **Large Combustion Plant Directive**
 - **IED** – **Industrial Emissions Directive**

Existing directives

- **IPPC Directive**

Plant specific permit based on BAT (Best available Technology) covering all emissions and overall plant performance

- **LCPD**

Sets three options for compliance on emissions:

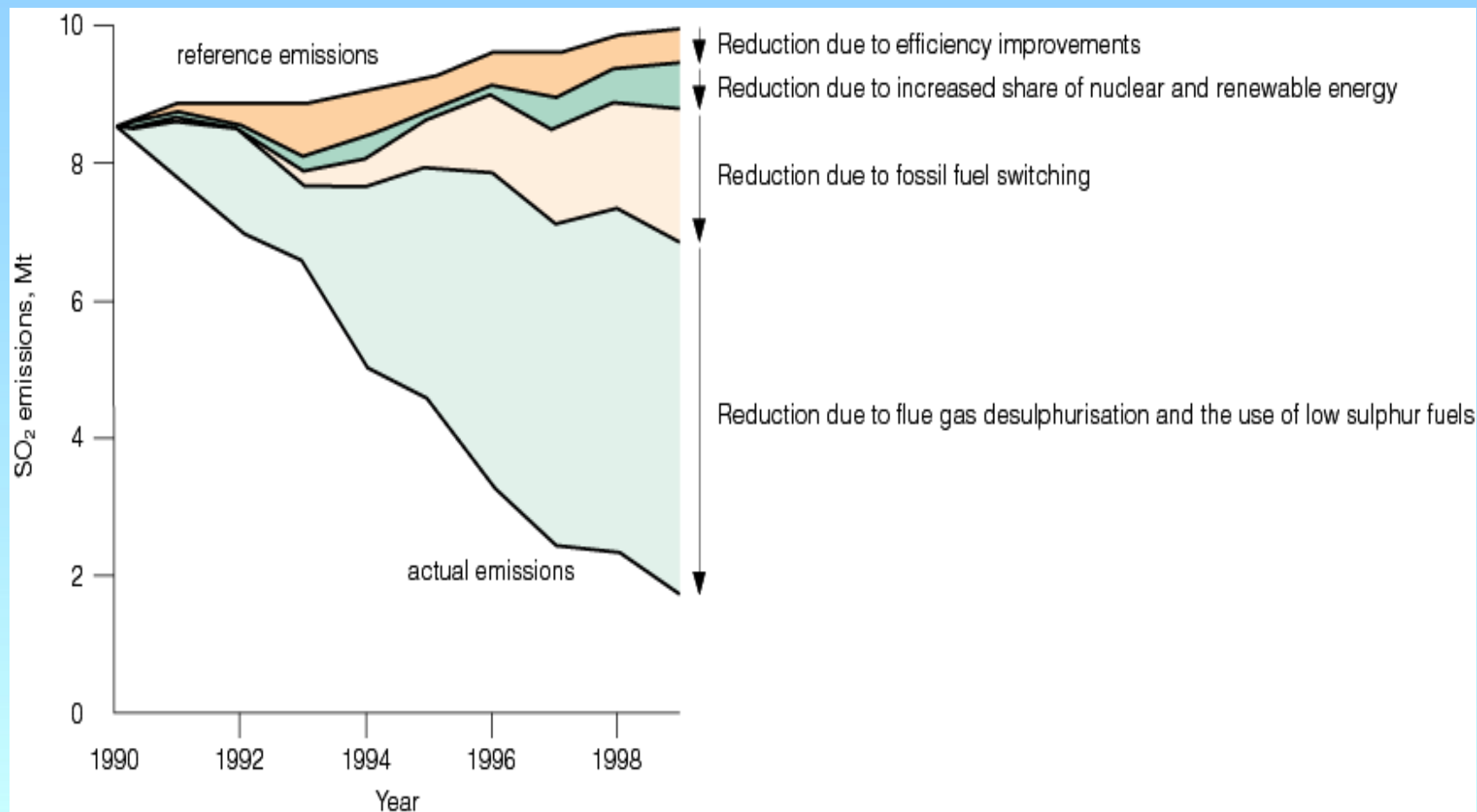
- **Emission limit values**
- **National Emission Reduction plan**
- **Opt-out and shut down by 2016**

Emission limits defined by IPPC and LCPD were contradictory

| Capacity, MWth | IPPC BAT emission values, mg/m ³ | | LCPD ELVs, mg/m ³ | |
|--|--|-------------------|------------------------------|--------------------------|
| | New plant | Existing plant | New plant | Existing plant |
| Sulphur dioxide, SO₂ | | | | |
| 50–100 | 200–400 | 200–400 | 850 | 2000 |
| 100–300 | 100–200 | 100–250 | 200 | 2000–400 linear decrease |
| 300–500 | 20–150 | 20–200 | 200 | 2000–400 linear decrease |
| >500 | 20–150 | 20–200 | 200 | 400 |
| Nitrogen oxides, NO_x | | | | |
| 50–100 | 90–300 | 90–300 | 400 | 600 |
| 100–300 | 90–200 | 90–200 | 200 | 600 |
| 300–500 | 90–150 | 90–200 | 200 | 600 |
| >500 | 90–150 | 90–200 | 200 | 500 |
| Particulate matter | | | | |
| 50–100 | 5–20 | 5–30 | 50 | 100 |
| 100–300 | 5–20 | 5–25 | 30 | 100 |
| 300–500 | 5–10 | 5–20 | 30 | 100 |
| >500 | 5–10 | 5–20 | 30 | 50 |

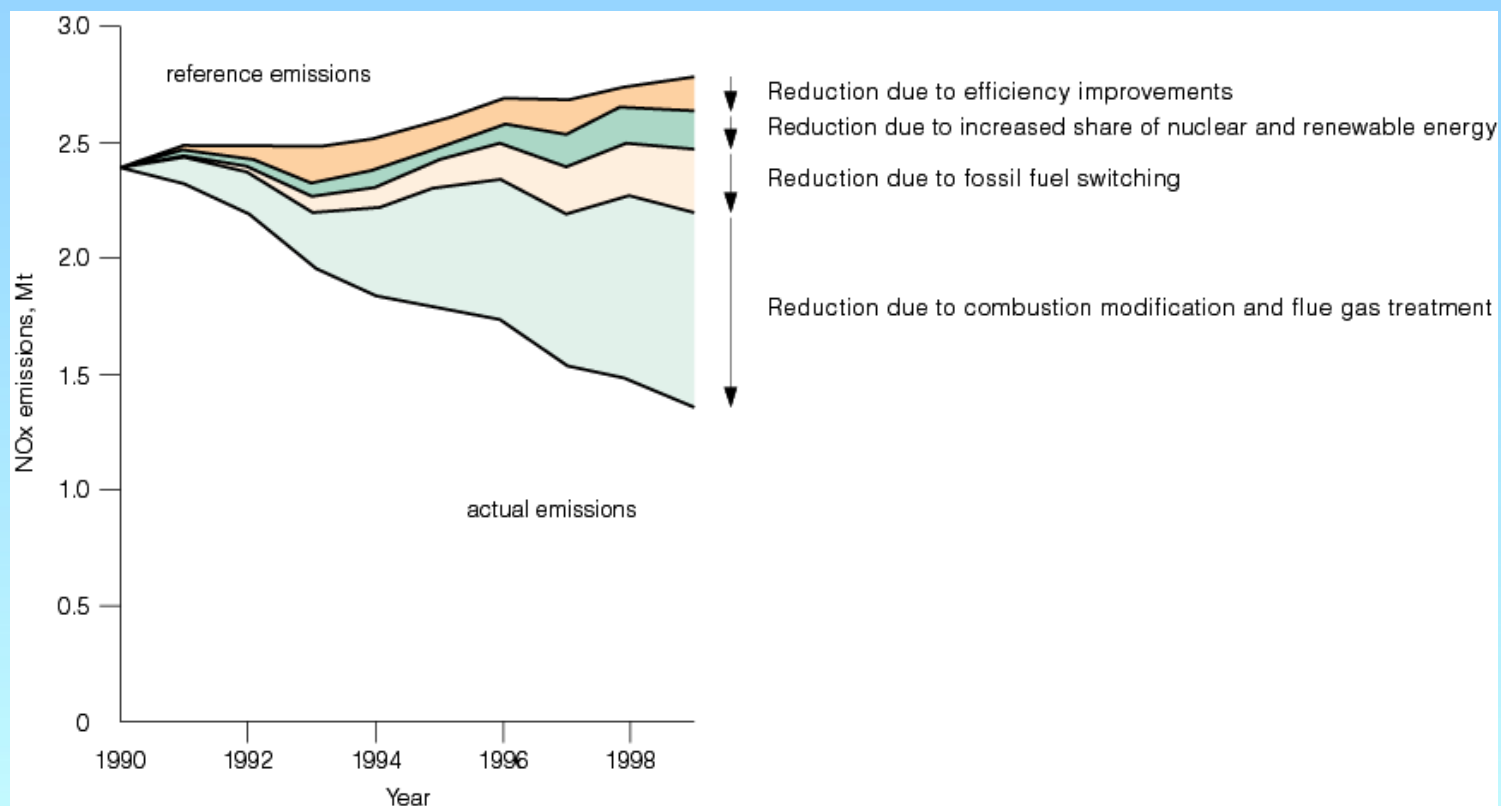
Legislation to date has achieved significant reductions

SO₂ emissions from electricity generation in the EU



Legislation to date has achieved significant reductions

NO_x emission reductions from electricity generation in the EU



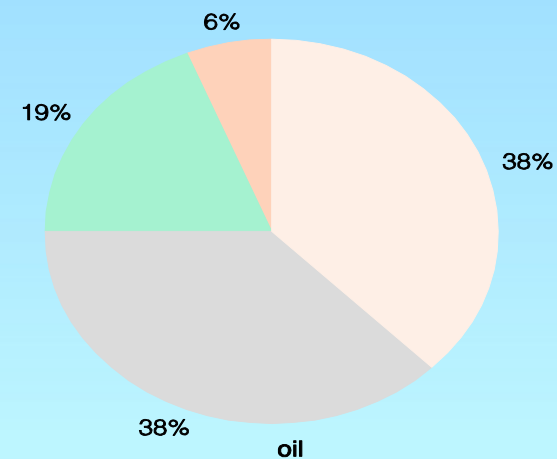
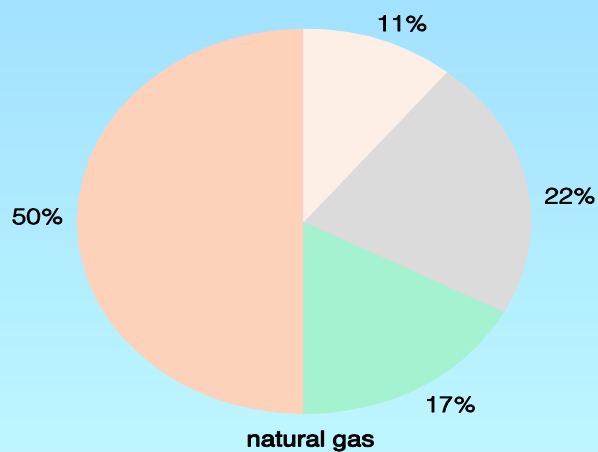
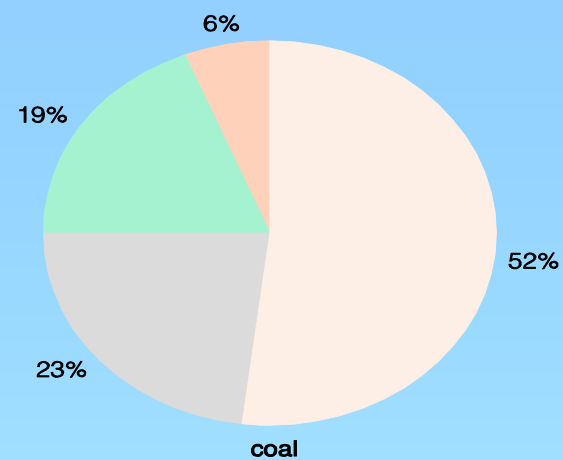
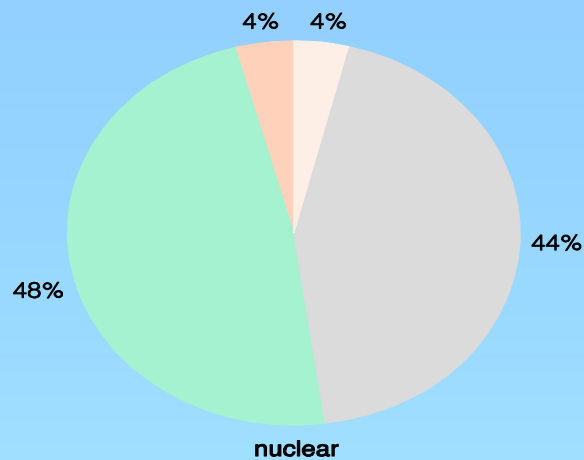
New IED

- **Combines the IPPC and LCPD along with the Waste Incineration Directive**
- **Still permit based**
- **Still includes BAT requirements**
- **Same requirements to select either ELV, NERP or opt-out options**
- **Time scale is less restrictive (opt-outs to close by 2023)**

What does the IED mean in practice?

- **All coal-fired units must have efficient ESP or baghouses/fabric filters**
- **All coal-fired units must have installed FGD or equivalent technology to reduce emissions down to 150-400 mg/m³ (depending on plant size) or achieve over 92% removal (depending on plant size and age)**
- **All coal-fired units must use low NO_x burners and/or SCR/SNCR to reduce NO_x emissions below 150-300 mg/m³**
- **Plants must either meet this, work under a trading bubble or opt-out and close following limited operation until 2023**
- **Monitoring must be continuous**

But - plants in the EU are aging



more than 30 years
 20 - 30 years
 10 - 20 years
 less than 10 years

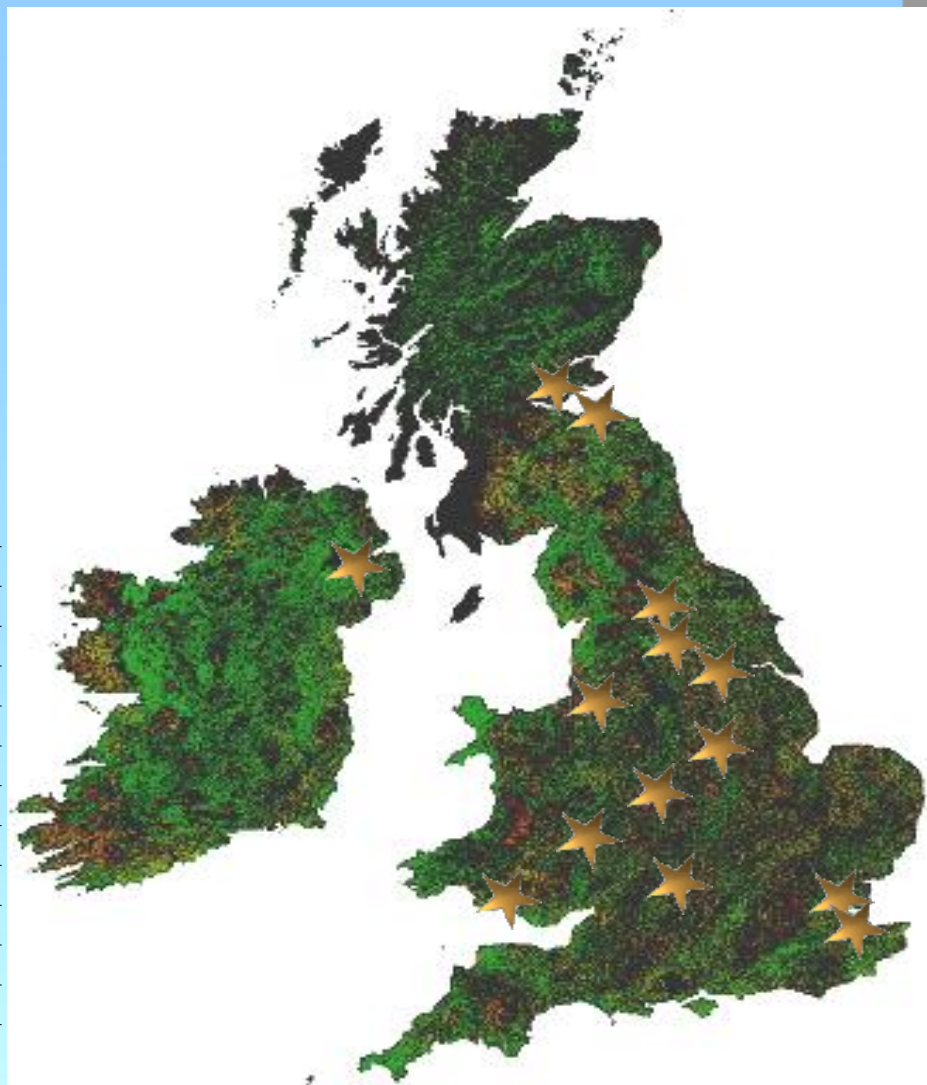
Compliance is expensive – eg some of the existing UK Coal Fleet will opt-out

LCPD Opt Out

| Power station | Owning Company | MWe |
|-----------------------|----------------|------|
| Ironbridge | Eon | 972 |
| Kingsnorth | Eon | 2000 |
| Didcot | RWE Npower | 1920 |
| Tilbury | RWE Npower | 1050 |
| Cockenzie | Scottish Power | 1200 |
| Ferrybridge (2 units) | SSE | 1000 |
| Total Opt-Out | | 8142 |

LCPD Opt In

| Power station | Owning Company | MWe | Approach |
|-----------------------|---------------------|-------|----------|
| Kilroot | AES | 520 | ELV |
| Eggborough | British Energy | 2000 | NERP |
| Uskmouth | Carron Energy | 393 | ELV |
| Drax | Drax Power Limited | 3960 | NERP |
| Cottam | EdF Energy | 1948 | ELV |
| West Burton | EdF Energy | 1924 | ELV |
| Ratcliffe | Eon | 2000 | ELV |
| Rugeley | International Power | 996 | ELV |
| Aberthaw | RWE Npower | 1386 | ELV |
| Longannet | Scottish Power | 2400 | NERP |
| Ferrybridge (2 units) | SSE | 1000 | ELV |
| Fiddlers Ferry | SSE | 2000 | ELV |
| Total Opt In | | 20527 | |



Conclusions

- **The EU has updated and unified legislation for coal-fired units**
- **The new legislation (IED) will effectively require DeNOx and FGD on all plants by 2016**
- **Those that cannot comply must close by 2023**
- **Many plants in the EU are too old to merit such investment**
- **Coal capacity will be reduced substantially in many countries in the EU in the short-term future**
- **Investment is needed in efficient and clean new build plants**