

A.J. Jablonowski, PE

ENVIRONMENTAL REGULATIONS

Mercury & Air Toxics Standards

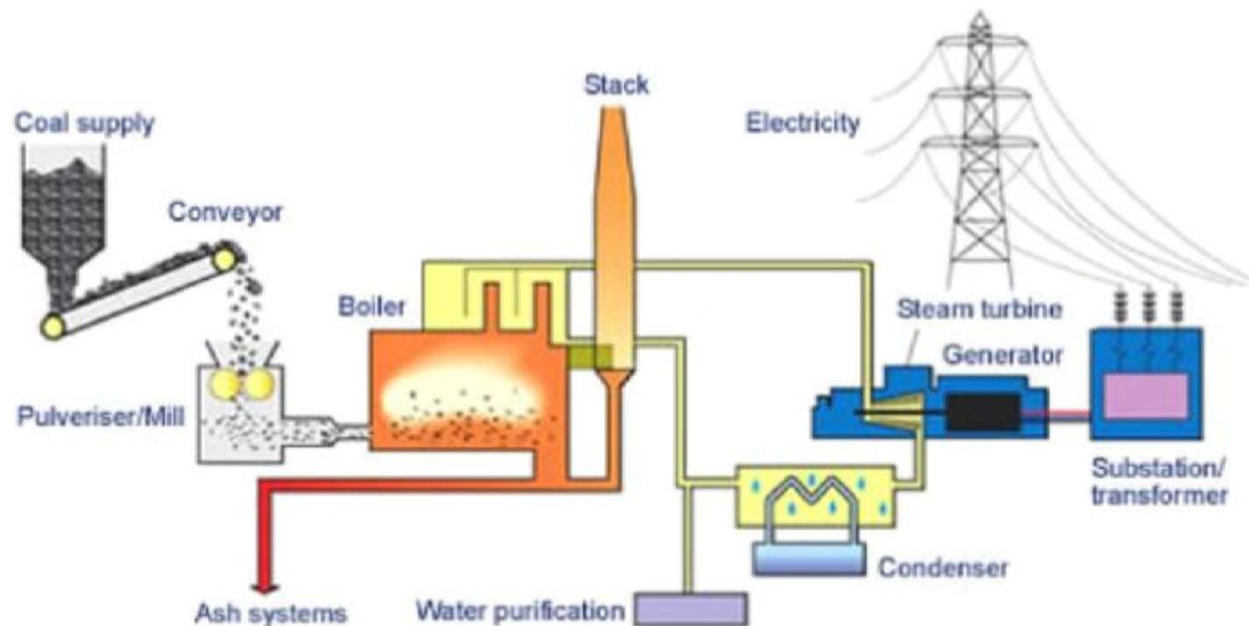
Coal Combustion Residual Rule

316b Water Intake Regulations

Effluent Guidelines for Wastewater Discharges

Power Plant Environmental Impacts

- Air Emissions
- Solid Residuals
- Water Intake
- Wastewater



Mercury & Air Toxics Standards (MATS)

- Limits toxic metals (including mercury) and acid gases from coal & oil plants
- Latest in a list of efforts to reduce power plant air toxics
- Implementation questions

MATS: Focus

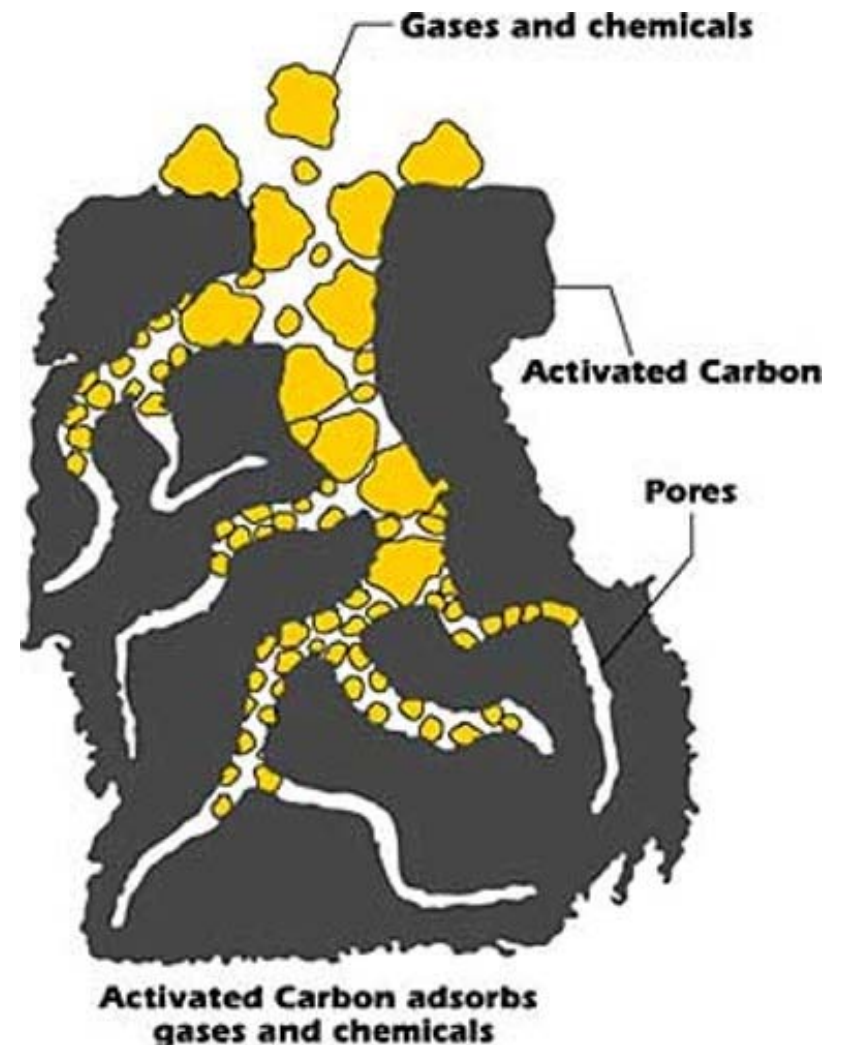
- Standards for all hazardous air pollutants (HAPs) from coal & oil-fired units >25 MW
- Existing sources comply by April 2015
- New sources comply now

MATS: History

- 1990 Clean Air Act Amendments: Study & Regulate if needed
- 1998 Utility Air Toxics Study Complete
- 2000 EPA says “appropriate & necessary” to regulate utility air toxics
- 2004 Clean Air Mercury Rule (CAMR) proposed
- 2005 CAMR finalized
- 2008 CAMR vacated by DC Circuit Court
- 2009 New Air Toxics Study
- 2011 Proposed MATS
- 2012 “Finalized” MATS
- 2013 MATS updates & reconsideration

MATS: Effects & Costs

- Air Pollution Control Retrofits
- Scrubbers, baghouses
- Activated Carbon Injection



Coal Combustion Residual Rule

- CCR versus “Ash”
- Is it a waste?
- Is it hazardous?
- Disposal costs
- Release examples

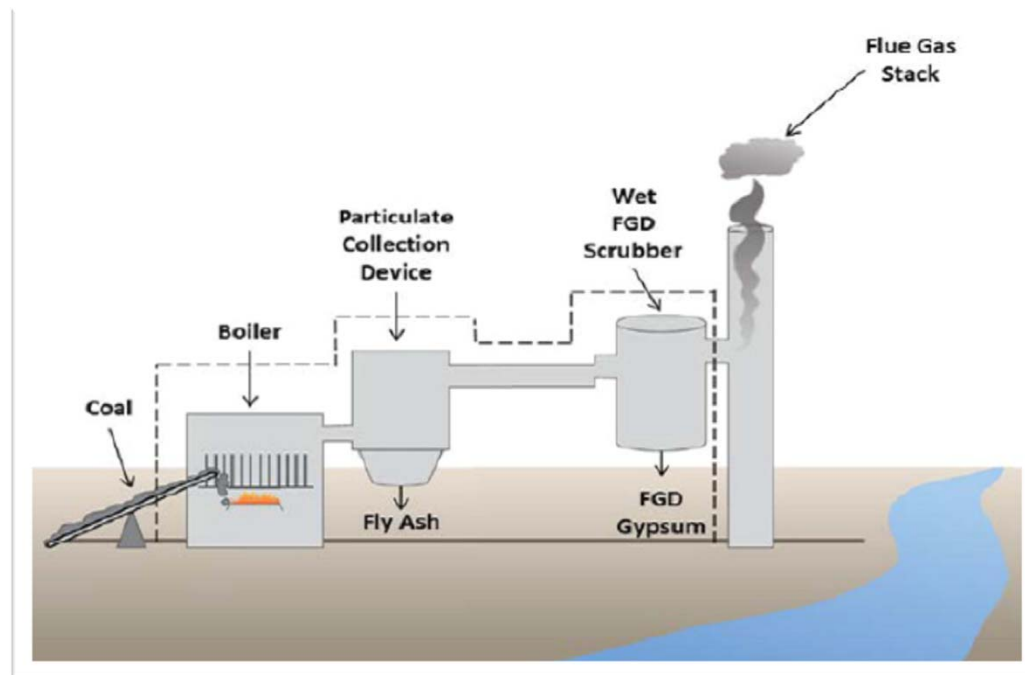


Coal Combustion Residual Rule

- Coal Combustion Residuals (CCRs) are byproducts from the combustion of coal – fly ash, bottom ash, boiler slag, and flue gas desulfurization materials.
- Currently (2008) more than **136 million tons** generated per year: 34 % (46 million tons) landfilled
 - 22% (29.4 million tons) disposed of in surface impoundments
 - nearly 37% (50.1 million tons) beneficially used
 - nearly 8% (10.5 million tons) placed in mines
 - 75 % of impoundments are greater than 25 years old; 10% greater than 50 years old
 - Approximately 300 CCR landfills and 584 surface impoundments in use at approximately 495 coal-fired power plants

Coal Combustion Residual Uses

- Gypsum: 7.6 million tons/year
- Concrete: 11.8 million tons/year
- Potential for growth as more coal plants use Flue Gas Desulfurization (FGD)
- Activated Carbon makes it less useful





CCR: Releases from Wet Impoundments

- December 2008 TVA Kingston, TN: flooded >300 acres, flowed into Emory & Clinch rivers, filling large areas and causing fish kills.
- February 2014 Duke Energy Dan River NC: tens of thousands of tons of coal ash and 27 million gallons of contaminated water; articles on “defanged” state regulator.

CCR: Proposed Rule

- Proposed June 2010
- Comments closed September 2013
- Final Rule Due 12/19/2014
- New dry landfills need a liner & groundwater monitoring
- Old dry landfills need groundwater monitoring
- **Wet impoundments essentially banned:
7-year phaseout**
- Beneficial reuse, mine reclamation unaffected
- Hazardous/non-hazardous: same general requirements, different enforcement

Water Intake Regulations

- 316a water discharge (thermal)
- 316b water intake (impingement & entrainment)
- 401/404 Water Quality Certificates

316b Impingement & Entrainment

- Impingement: Smacked against the intake
- Entrainment: Sucked through the system
- Remedies
 - *Use less water*
 - *Slower intake*
 - *Gentler screens*



316b: Use Less Water



Brayton Point
Massachusetts

driven by
401 WQC process

Indian Point
New York

fighting same process

Proposed 316b: New electric capacity must be closed-cycle
(cooling towers), existing sources case-by-case

316(b) Rule Under Clean Water Act Cooling Water Intake Structures (CWIS)

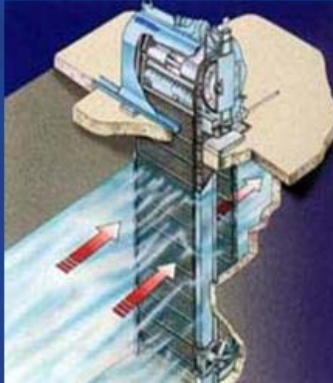
Draft rule in comment Phase

Final rule expected July 2012


~~1/28/2014~~

4/17/2014

- Minimize adverse impacts on adult fish, juvenile fish (impingement), small juveniles, fish larvae, fish eggs and larvae(entrainment) through location and design of CWIS
- Affects **670** EGUs mostly (B10, ACC and SEC)
- Performance standards for Impingement
 - flows > 2MGD
 - **use of Ristroph screen and fish return to limit fish mortality>>>>>>>>>>>>>>**

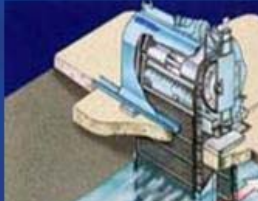


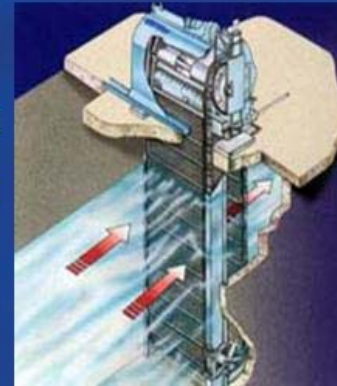
The diagram illustrates a cross-section of a cooling water intake structure. It shows water being drawn from the bottom left into a vertical shaft. Inside the shaft, there are multiple horizontal screens or filters. Red arrows indicate the flow of water upwards through the structure. At the top right, there is a return system where water is discharged back into the body of water, designed to minimize fish mortality.

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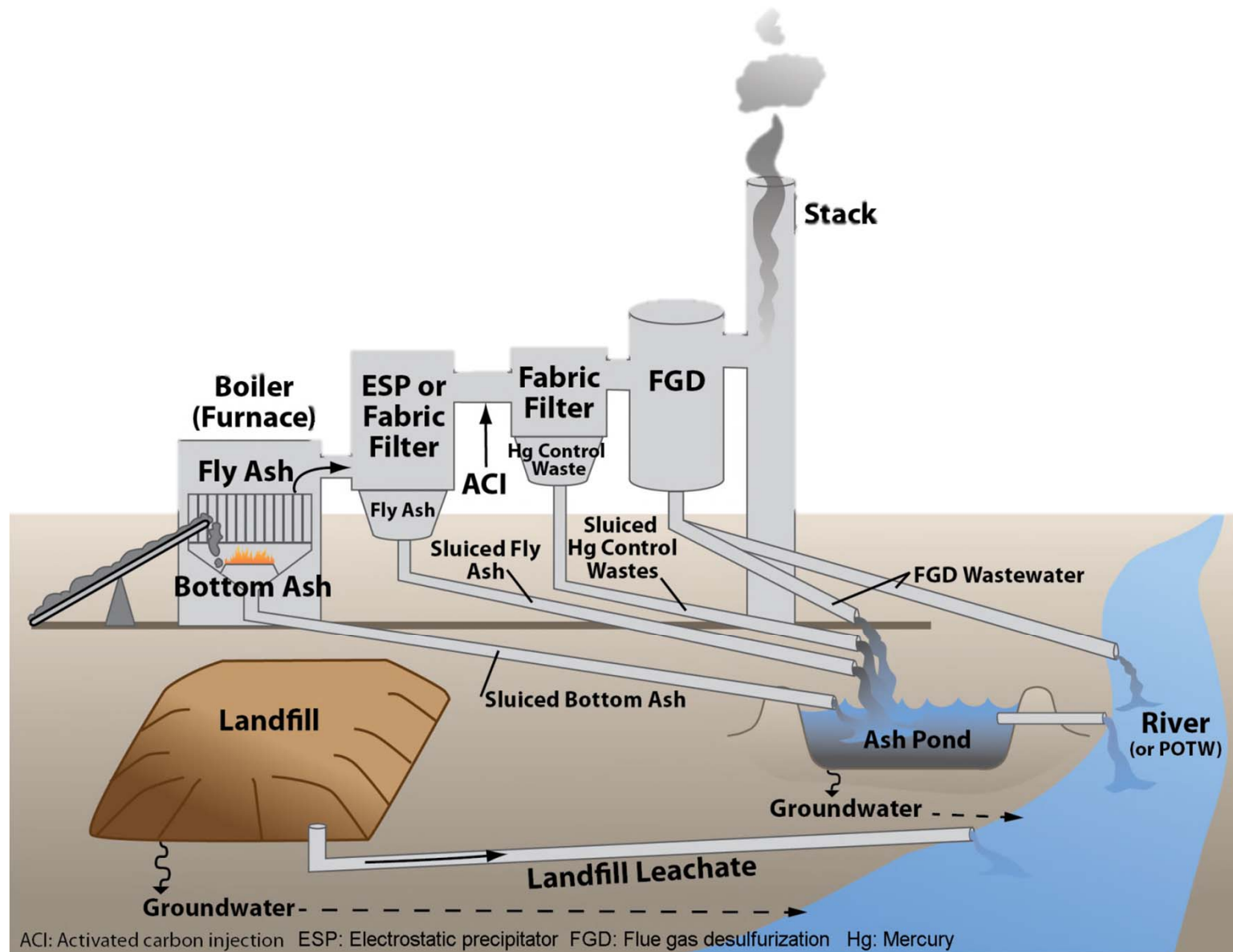
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Effluent Guidelines for Wastewater Discharges



Effluent Guidelines for Wastewater Discharges

- Existing 1982 rule covers suspended solids only
- Proposed rule covers metals, nutrients
- Some waste streams must be re-used onsite (zero discharge)
- Final rule due May 22, 2014 per consent decree

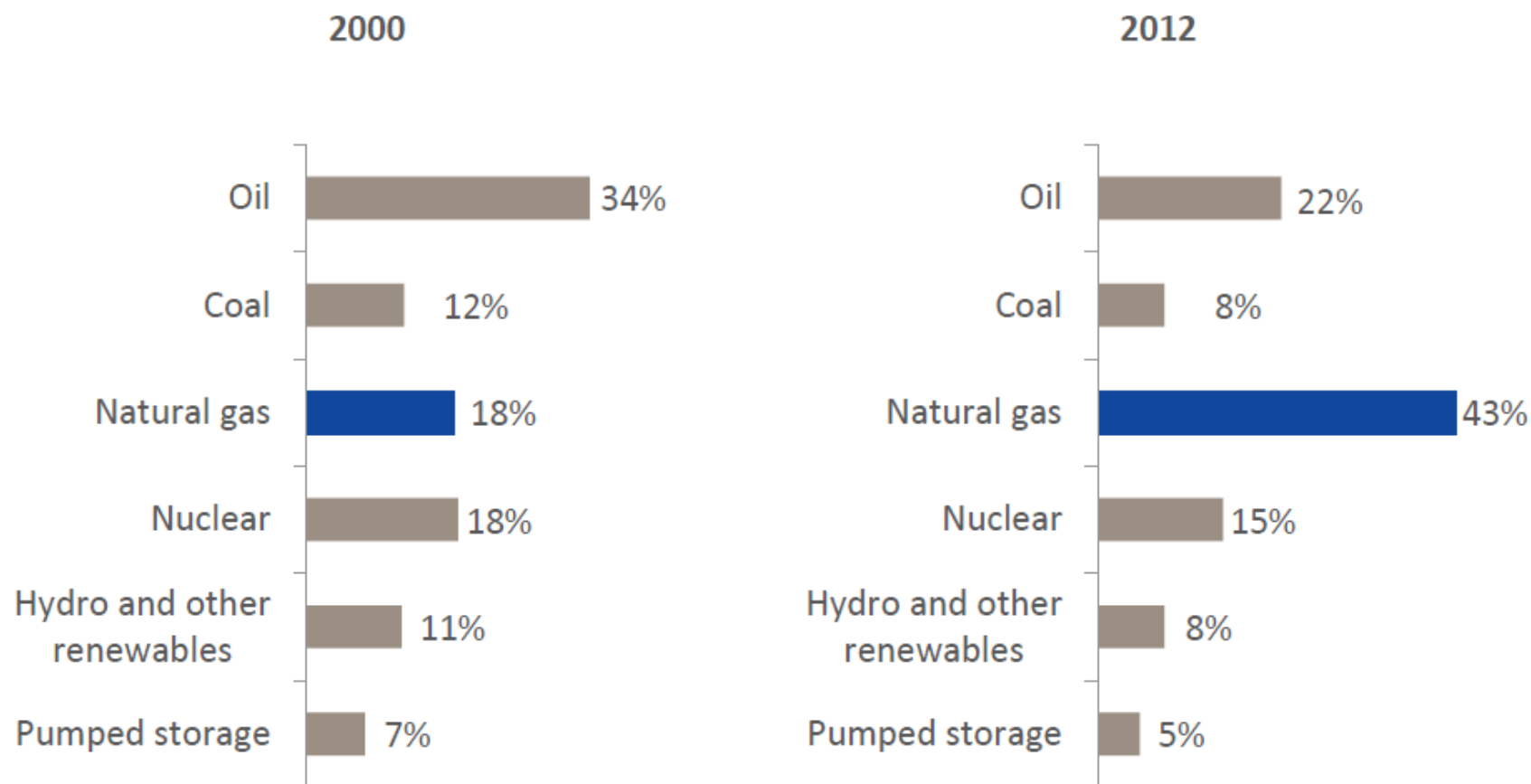
Effect on Regional Generation

- Pressure on existing coal generation
 - Retire smaller, stoker-fired units (<200 MW)
 - Retrofit larger units
- 316b Pressure on nuclear
- Difficulty licensing new coal generation
- In my opinion, secondary to fuel & electricity prices

ISO-NE Regional *Capacity* Profile

Regional *Capacity* Shifts Toward Natural Gas

Percent of Total System Capacity



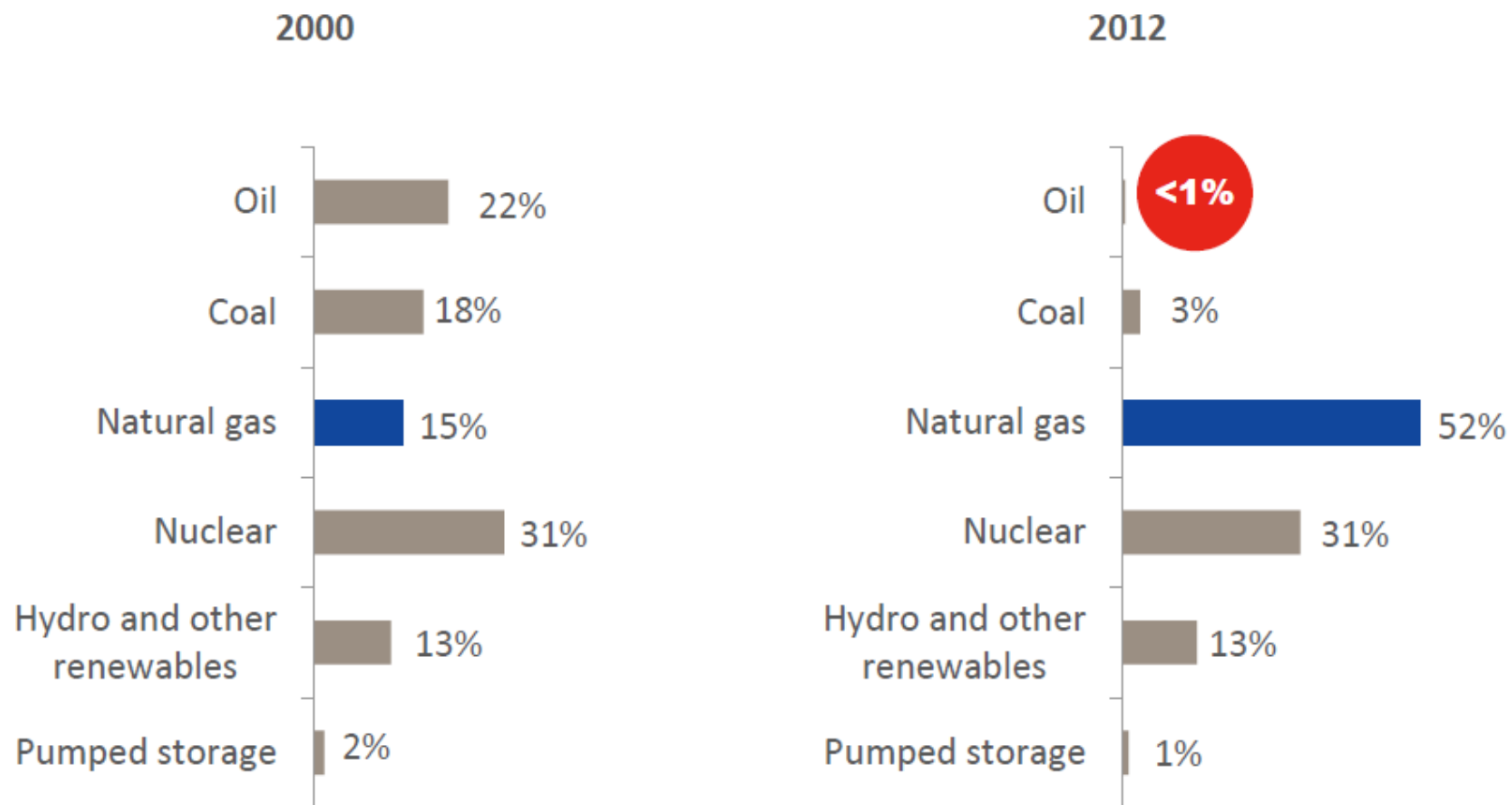
Other renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.

Source: Regional Profile (2012/13)

ISO-NE Regional *Energy* Profile

Regional *Energy* Shifts Toward Natural Gas

Percent of Total Electric Energy Production



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Source: Regional Profile (2012/13)

Thank you



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