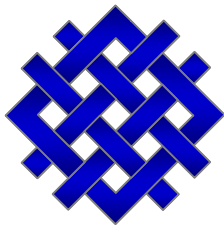


Emissions Trading in Washington: Considerations for the Electric Sector

Washington Climate Advisory Team
Market-based Mechanisms Ad Hoc Committee
Webinar
August 24, 2007



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What is cap and trade? Allowances match emissions

- The government sets an overall cap on emissions.
- The government issues/auctions allowances (tradable rights to emit one ton of GHGs).
- The total number of allowances (plus credits) match the emissions cap.
- Each regulated entity must surrender enough allowances to match its emissions for each compliance period.
- Flexibility: As long as allowances match emissions, firms can select means; allows firms to minimize costs.



Cap and Trade Key Design Elements

- Stringency (targets and timetables)
- Scope and Point of Regulation
 - Scope: What emissions, sectors, greenhouse gases, facilities, and/or fuels are covered?
 - Point of Regulation: Who has the obligation to surrender allowances to match emissions?
- Allowance distribution (How are emission allowances initially distributed?)
- Recognition for early action (what actions over what timeframes?)



Design elements, cont'd

- Offsets: What project-based reductions outside the covered sources should be allowed to “offset” emissions under the cap?
- Other cost containment mechanisms: What other means should be employed to minimize costs (e.g., safety valve, banking, etc)?
- Program fundamentals: monitoring, reporting, auditing, compliance and enforcement, evaluation and adjustment, etc.



Scope of Coverage and Point of Regulation

- What GHG emissions are included in the cap and trade program?
 - What greenhouse gases?
 - What sectors?
 - What facilities? What types and thresholds?
 - What fuels?
 - Combustion emissions included? Process-related emissions?
 - Embodied emissions?
- Who has the obligation to surrender allowances to match emissions?
 - Upstream (where GHGs enter the economy, or close)
 - Downstream (where GHGs are emitted into the atmosphere)
 - Other (local distribution companies)
 - Hybrid (cover large sources downstream, address the rest of the economy at a different point of regulation or through other policy tools)



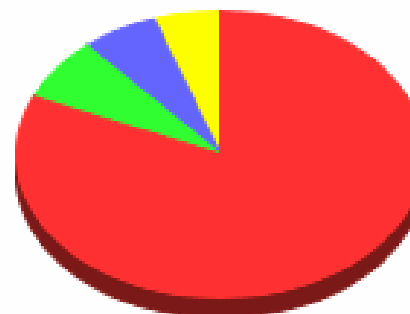
Key Considerations in Deciding Question of Scope & Point of Regulation

- Maximize breadth of coverage taking into account administrative feasibility
- Integrity of emissions data
 - Availability of data before setting baseline key consideration
 - Ability to measure, monitor & report emissions data at the point of regulation
- Number of covered sources
 - Too large a number administratively complex
 - Too small a number threatens viability of emissions commodities market

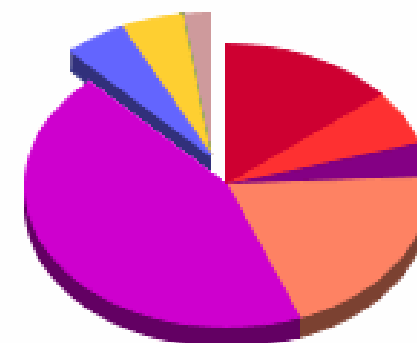


Scope of Coverage in WA

Gas	MtC	%
CO2	14.5	81.5
CH4	1.3	7.1
N2O	1.1	6.1
F-Gases	0.9	5.3
Total	17.8	



Sector	MtC	%
Energy	23.9	134.1
Electric Utilities	3.8	21.3
Residential	1.7	9.5
Commercial	1.1	5.9
Industrial	5.4	30.5
Transportation	11.9	66.8
Fugitive Emissions	0.0	0.0
Industrial Processes	1.3	7.3
Agriculture	1.4	7.6
Land-Use Change & Forestry	-9.3	-52.3
Waste	0.6	3.3
Total	17.8	



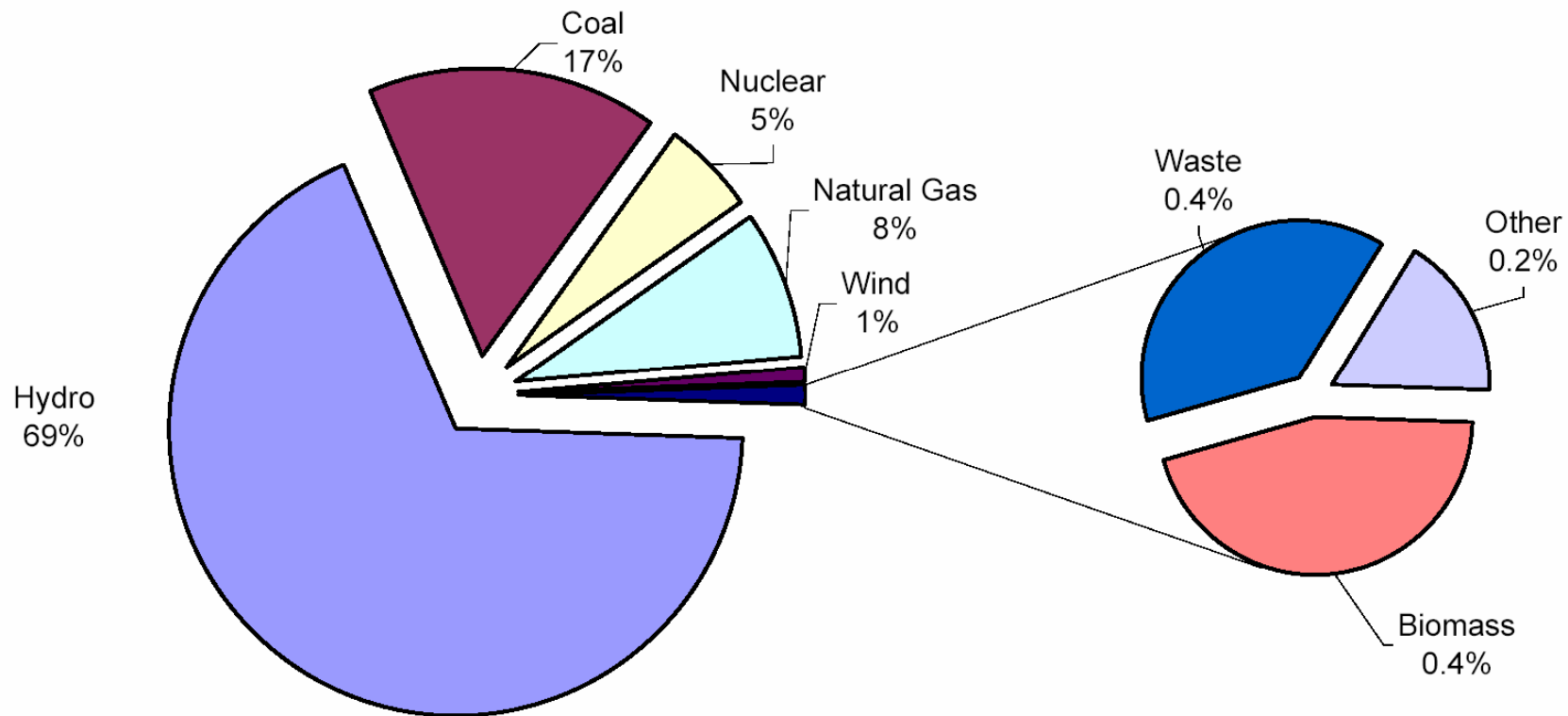
* Represents shares of total emissions excluding LUCF.

Source: WRI, CAIT, 2001 data



W R I

2006 WA Electric Utility Fuel Mix



MWh Totals 87,425,313

Hydro: 59,609,529

Natural Gas: 7,319,961

Wind: 867,392

Waste: 331,963

Coal: 14,245,188

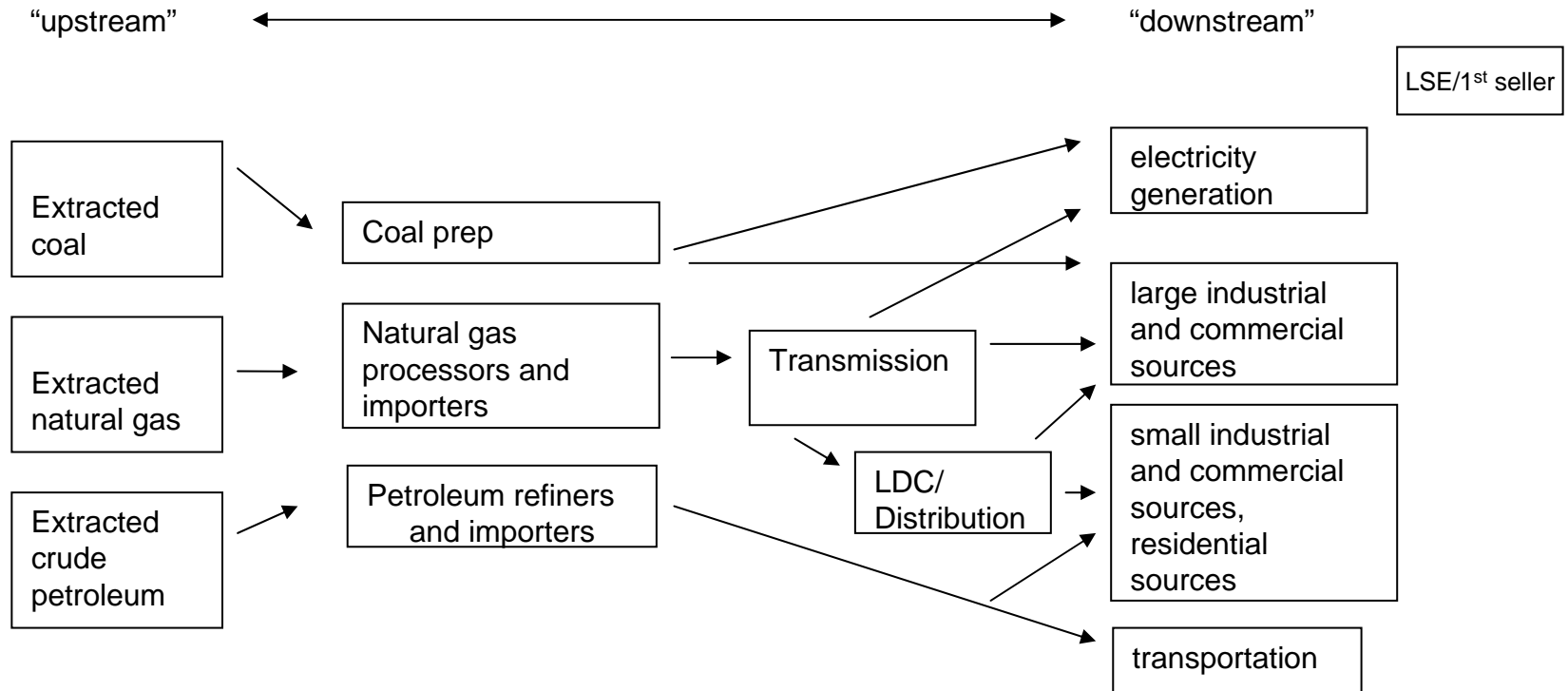
Nuclear: 4,513,216

Biomass: 392,712

Other: 145,352



Upstream/Downstream



Pros and Cons

UPSTREAM

- Most comprehensive coverage at the smallest number of facilities
 - Greater coverage leads to lower costs
- Possibility of lower administrative costs
- View that response to price signal independent of point of regulation

DOWNSTREAM

- View that point of regulation does affect behavior; that emitters generally have more compliance options than fuel providers; and that it's appropriate for regulated entities to be the ones with options
- Most real-world experience is with downstream (acid rain, eastern NO_x program, EU ETS); or upstream where substitutes are available (CFCs, lead in gasoline)
- Facility-level data availability (already reported for electric power plants; protocols and data collection easily expandable to other large stationary combustors)
 - NJ GHG mandatory reporting example
- Automatically rewards CO₂ emissions-reducing technologies; not just technologies that reduce fuel C content (CCS, etc.)
- Can phase in coverage over time



Load-Based Cap-and-Trade Designs

- Electric Sector Load-based Design (OR, CA PUC)
 - Emissions are attributed to electrons
 - Load-serving entities (LSEs) are required to hold allowances to cover emissions attributable to the power they deliver
- Electric Sector First Seller Approach (CA MAC)-- applies to the first seller of electricity in the state, meaning:
 - Generators in the state (emissions sources) and
 - Sellers into the state of electricity generated out of state (seller to LSEs).



Relevant Experience for Scope of Coverage and Point of Regulation

- EU ETS
 - CO₂ only
 - Covers large sources downstream (electric powerplants, combustion and process emissions in major manufacturing sectors)
- US Acid Rain Program:
 - SO₂ emissions from utility powerplants (downstream)
- Eastern NO_x program:
 - NO_x from electric powerplants and large industrial boilers
- RGGI
 - CO₂ from powerplants



Options for Allowance Allocation

- Free Allocation—allowances given to affected entities
 - Key questions
 - What calculation formula will be used to determine allowance allocation?
 - What is the baseline for allocating?
 - Does free allocation create “windfall” for sectors able to pass costs through?
- Auction—entities bid to purchase allowances
 - Key questions
 - How much to auction and how?
 - What is the appropriate use of funds generated?
 - Will there be a form of revenue recycling?
- Hybrid of free allocation and auction
 - Key questions
 - How much of each and on what basis?



Free Allocation – Metrics

<u>Basis</u>	<u>Considerations for WA</u>
Emissions	<ul style="list-style-type: none">• Leaves every emitter “whole”• No reward for cleaner plants (e.g, no allowances for hydro)
Fuel or other input	<ul style="list-style-type: none">• Easy to measure• Rewards less efficient plants• No allowances for hydro, wind
Product output (Market share)	<ul style="list-style-type: none">• Rewards more efficient plants, hydro and renewables• Easy to measure for certain sectors, cumbersome for others
Benchmark (Standard factor based on emission rate X output)	<ul style="list-style-type: none">• Rewards more efficient and lower-emitting plants, may give no credit to zero emitting facilities• Flexible—can adjust factor to make easier or harder on various categories of emitters• Cumbbersome to address variety of outputs produced

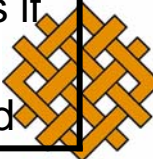


Free Allocation

<u>Options</u>	<u>Considerations for WA</u>
Emitters only	<ul style="list-style-type: none">• Consistent with goal of free allocation to address compliance costs• Benefits emitting facilities• No credit for hydro, renewables
Affected entities	<ul style="list-style-type: none">• Could allocate to affected entities, e.g. consumers or their proxies such as load serving entities• Can provide credits accounting for price increase, even where hydro is generating source
All product generators or producers	<ul style="list-style-type: none">• Benefits lower-emitting facilities, providing a subsidy for what may be an expensive, but cleaner, technology choice• Not all non-emitters are in need of additional subsidies
State or federal government for funding public policy objectives (Allowances are subtracted from pool)	<ul style="list-style-type: none">• Can be used to help to alleviate electricity/product price impacts of program• Could provide source of funds for end-use efficiency and other public benefit programs• Additional administrative burden associated with distributing benefit to non-emitters (public)• Benefits public with expense borne by industry

Calculating Free Allocations

<u>Options</u>	<u>Considerations for WA</u>
Single year	<ul style="list-style-type: none">• Easy to calculate• Any one year will be unfair to someone/hydro variability is key• Benefits entity with relatively high emissions in that year if allocation is based on emissions or fuel input• Benefits good performers against benchmark that year if allocation is based on a benchmark
Average of multiple years	<ul style="list-style-type: none">• Evens out unusually high or low years—less chance of picking a good or bad year for any one emitter• Missing data may be difficult to address• If projections are used, may be incentive to increase emissions if period includes future years• Benefits entities with relatively high emissions or relatively good performance in those years
Maximum over a period	<ul style="list-style-type: none">• Adjusts for different companies/sectors peaking at different times• Does not reward early reducers• If projections are used, may be incentive to increase emissions if period includes future years• Benefits entities reducing emissions at beginning of time period



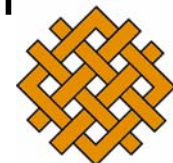
Free Allocation – Baseline

<u>Options</u>	<u>Considerations</u>
Updating	<ul style="list-style-type: none">• Accommodates growth in production (including new entrants) potentially minimizing consumer prices in that sector• Allows changes in markets, competition, plant closures, and new entrants to be considered and accommodated• Benefits increases in emissions, if based on emissions• Benefits increase in output, if based on output• Benefits growing entities and potentially consumers
No updating	<ul style="list-style-type: none">• Does not provide incentive to increase emissions• Growing firms will struggle more to meet compliance obligations than non-growing firms• Windfall to entities that have reduced production• Requires set-aside for new entrants• Benefits entities that have improved efficiency more than competitors and plants with decreasing production levels



Auction Considerations

- Government does not have to determine equitable distribution of allowances (though government does have to determine “allocation” of resulting revenues)
- Auction is fairer to new entrants
- Avoids potential for “windfall”
- Can be significant additional cost for cost sensitive sectors requiring compensatory policies (e.g., tax reductions)
- Benefits firms with lowest emissions (gas, nuclear, hydro) and disadvantages those with higher historic emissions
- Generates funds which could be used for investment in technology, compensation to affected parties, adaptation, etc.



Auction – Use of Funds

- Reduce existing taxes
- Fund environmentally desirable programs and policy objectives (e.g. R&D)
- Minimize cost of cap and trade program on affected parties, e.g. firms, workers
- Mitigate the regressive impact of increased energy costs on low-income consumers
- Adaptation assistance, etc.

Relevant Experience for Allowance Distribution

- EU ETS
 - For learning phase (2005-07), at least 95% of allowances allocated for free based on historic emissions
 - Recent significant increase in electricity costs seen by consumers; causes debatable
 - Considering increasing percentage auctioned for next phase
- US Acid Rain Program:
 - Most allowances allocated for free
 - 3% auctioned each year for price discovery but proceeds returned to covered sources; didn't raise revenue
 - Allocation based on both historic fuel input and environmental performance benchmarks
- Eastern NO_x program:
 - All allowances allocated for free
 - Allocation varied by state; based on historic fuel input or output, environmental performance benchmarks; some states updated and some did not
- RGGI
 - Up to each state
 - States jointly committed to use at least 25% of allowances for public benefit
 - Several RGGI states plan to auction 100% of allowances
 - In process of designing a regional auction



Recognition for early action

- Reward those firms that have acted to reduce GHG emissions and encourage others to do so while the program is being established.
- Two elements should be considered: addressing potential competitive disadvantages pre-cap and not disadvantaging post cap.
- Several options for doing this, including:
 - Auctioning allowances
 - Selection of emissions baselines
 - Basing allowances on an emissions performance benchmark



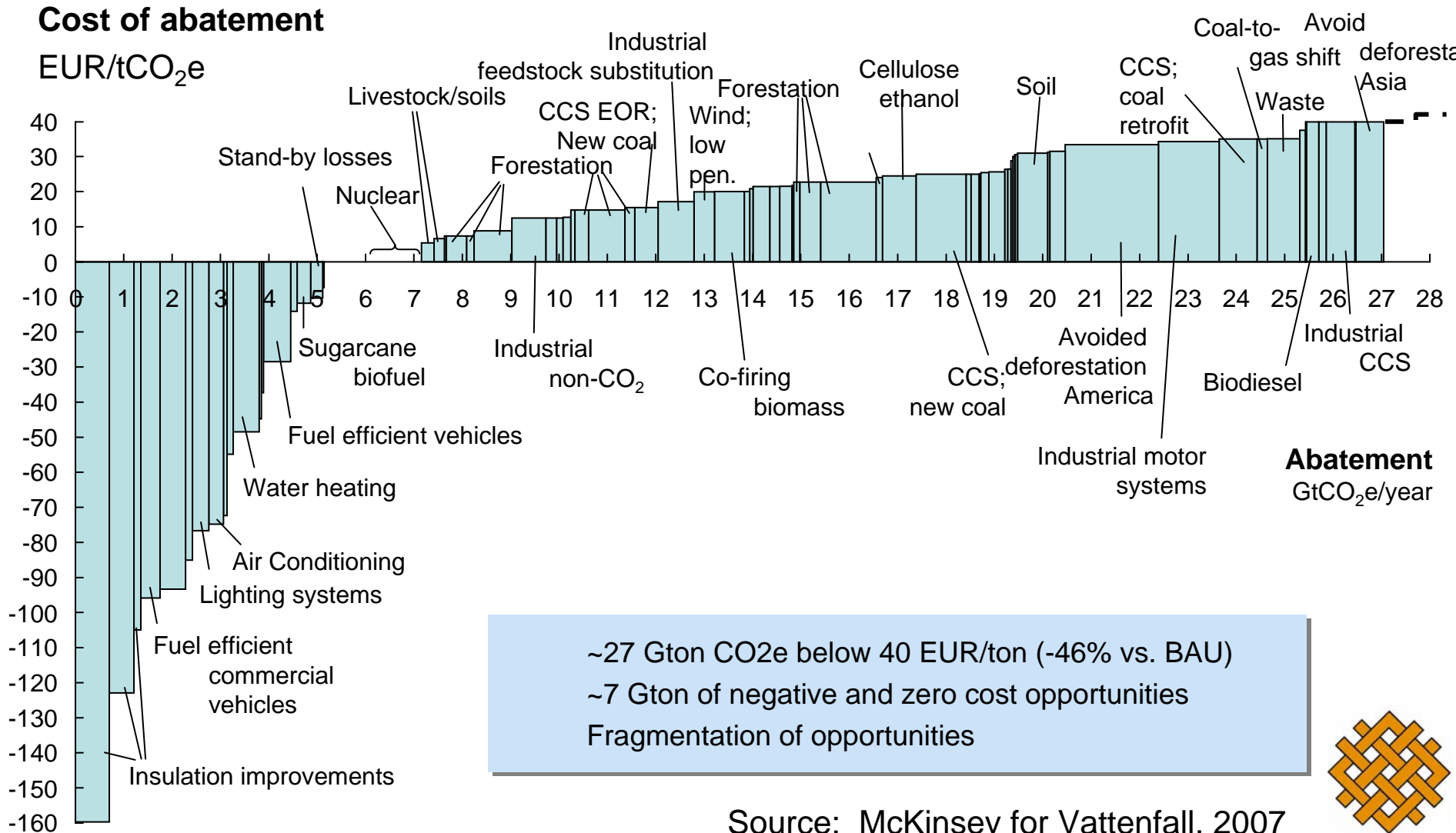
Offsets

- Offsets allow covered sources to secure credits for reductions from non-regulated sources.
- Substantial relevant experience (RGGI; CDM)
- Key questions:
 - What project-based reductions outside the covered sources should be allowed to “offset” emissions under the cap?
 - What criteria or standards should such projects meet?
 - Should there be quantitative limits on all or certain offsets?
 - Should there be geographic limits on offsets?



Global cost curve of GHG abatement opportunities beyond BAU

2030

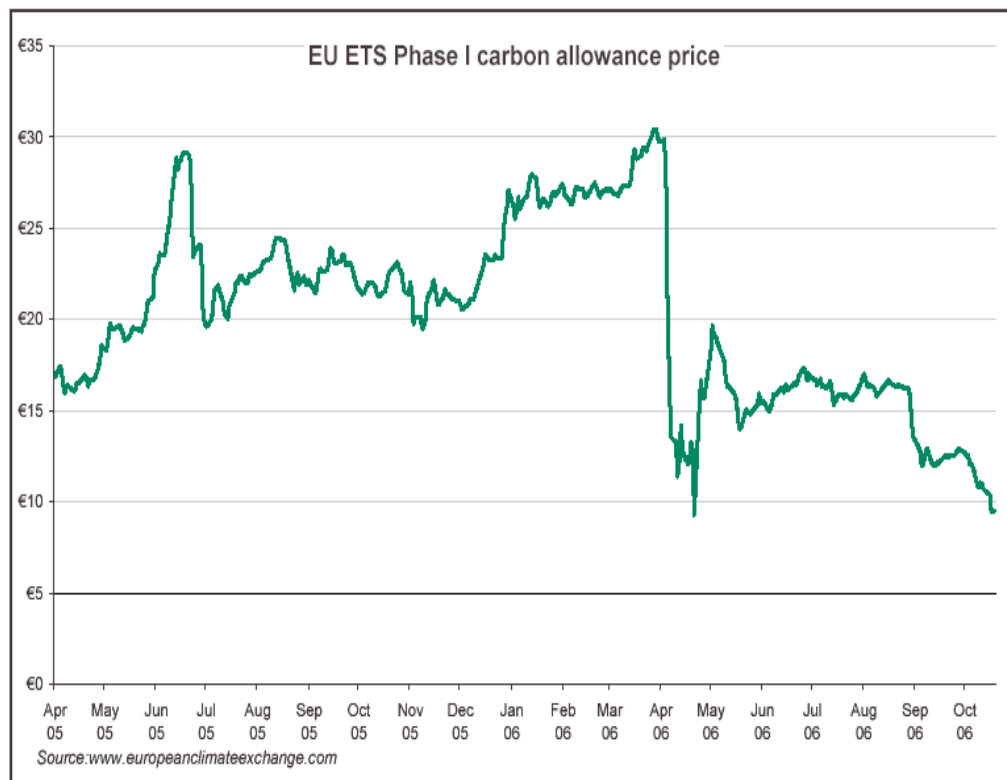


Source: McKinsey for Vattenfall, 2007



Other Cost Containment Measures

- Policies to provide capped entities with greater confidence that their compliance cost will be limited and flexibility to manage those costs
- Options include a safety valve, borrowing, strategic allowance reserve, preferential allocations, dedicated funding, technology incentives and transition assistance.



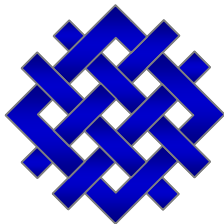
Cost Containment Measures

- Lessons learned:
 - Banking very valuable in SO₂ program; lack of banking a big problem in RECLAIM
 - US Acid Rain program had a guaranteed-priced allowance reserve for new entrants
 - Compliance periods:
 - Acid Rain: 1 year
 - RGGI: 3 years
 - EU ETS: 3 years for learning phase, 5 years for next phase
- Key Issues:
 - Ensuring the integrity of the cap
 - Preserving the market's effectiveness in driving reductions, investment and innovation in technologies (e.g., such as carbon capture and storage)



Linking beyond WA

- Linkage: Mutual recognition of allowances to allow emissions trading between systems.
- Linkage is easier if systems are similar, but very few insurmountable barriers.
- Considerations in linkage include environmental integrity, cost-effectiveness, relative stringency and fairness
- Key question: What are the criteria and circumstances under which linkage is appropriate?



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