

Lessons Learned (1)

- **The 2007/8 Climate and Energy Package was adopted within a unique political constellation**
 - Consensus within *and* between EU Institutions (European Council, European Commission, European Parliament, *certainly for EU-15*)
 - Strong and committed leaders ('positive EU cycle')
 - Expectation of a Global Agreement
 - EU dominated by EU-15 (?)

Differences:

international, economy, EU (less confidence, more heterogeneity)

Question: How does this affect post-2020 climate policy?

Lessons Learned (2)

- **The 2007/8 Climate and Energy Package was based on the assumption of a Global Climate Change Agreement**

Question: What relationship between EU and international climate change policy?

- **Projections are a risky foundation for policy**
 - We do not know the future (e.g. banking crisis, Euro-crisis, Great Recession, IEA fuel price forecasts ...)
 - Accidents happen (e.g. Fukushima and its national and global implications)
 - Disruptive technological change (e.g. shale gas, storage technologies?)

Question: How to make post-2020 climate policy more future-proof?

Lessons Learned (3)

- **Interactions between different policies exists (irrespective of targets). Existing mechanism (i.e. linear reduction factor, ex-ante Impact Assessment, three targets) were not sufficient to address interactions**

Questions:

- (1) Can one headline target, i.e. CO₂ deal with interactions? Is one headline target realistic?
- (2) What mechanism can be designed to address interactions?
- (3) Are separate energy and climate policies better suited to deal with interaction? (example: car efficiency standards)

Lessons Learned (4)

- **Industrial policy benefits (technology leadership, export-led growth, green jobs/growth/ economy etc.) have lacked evidence**

Question: How will evidence affect post-2020 climate policy?

- **Administrative capacity and capability to pay of member states varies**

Question: How can post-2020 climate policy address this?

Lessons Learned (5)

- **Regulation works, e.g. car efficiency standards, regulation for houses ..s**

Question:

Should regulation be back? Is regulation only to address market failure?

- **Least-cost policy (ETS) faces political obstacles while high-cost policy is successful**

Question: Where does this difference stem from?

- (1) (Perceived) local benefits?**
- (2) Distributional impacts?**
- (3) Lack of transparency of high cost policy?**
- (4) Economic rents in sunk costs and fossil fuel reserves?**
- (5)**

Lessons Learned (6)

- **Importance of national/local energy and other policy choices have been underestimated (German energy transition, UK price floor, contract for differences, nuclear policies)**

Question: How can post-2020 climate policy best address this?



Objectives of the EU C&E policy

- **Is de-carbonization the main objective?**
- **Is this**
 - Climate change policy &
 - Energy tools to achieve that climate change policy
- **What is the objective of**
 - GHG caps
 - RE targets
 - EE objectives

- **Other objectives of C&E framework ?**
 - Energy prices
 - Competitiveness
 - Innovation & jobs
 - Recognize diversity
 - Energy security (gas, oil, import dependence?)

- **Targets**
 - Do we need intermediate targets & 2050 target ?
 - How are targets expressed ?
 - What do target include ?

Objectives of the ETS

- **Lack of clarity of objectives leads to**
 - Difficulty in defining criteria for success
 - Difficulty to diagnose problems, if any
 - Difficult to prescribe cures
- **ETS Directive**
 - Promote reductions in a cost effective manner
 - Reduction to scientifically necessary reductions
- **ETS Criteria for success**
 - Deliver environmental objectives
 - Well functioning market
 - Price signal for 2050 de-carbonization in an efficient way
 - Do not disadvantage EU industry open to global competition
- **ST vs LT efficiency**
- **Best solution to 2020 is best solution to 2050**

Carbon pricing in EU C&E Policy

- **EU ETS: EU carbon pricing tool**
- **What is the role of carbon pricing: Leading or residual signal/instrument**
- **Characteristics to play that role ?**
- **Carbon pricing**
 - A necessary tool
 - Works if used for the right job
 - Needs other tools to do the job

Carbon taxes in Europe

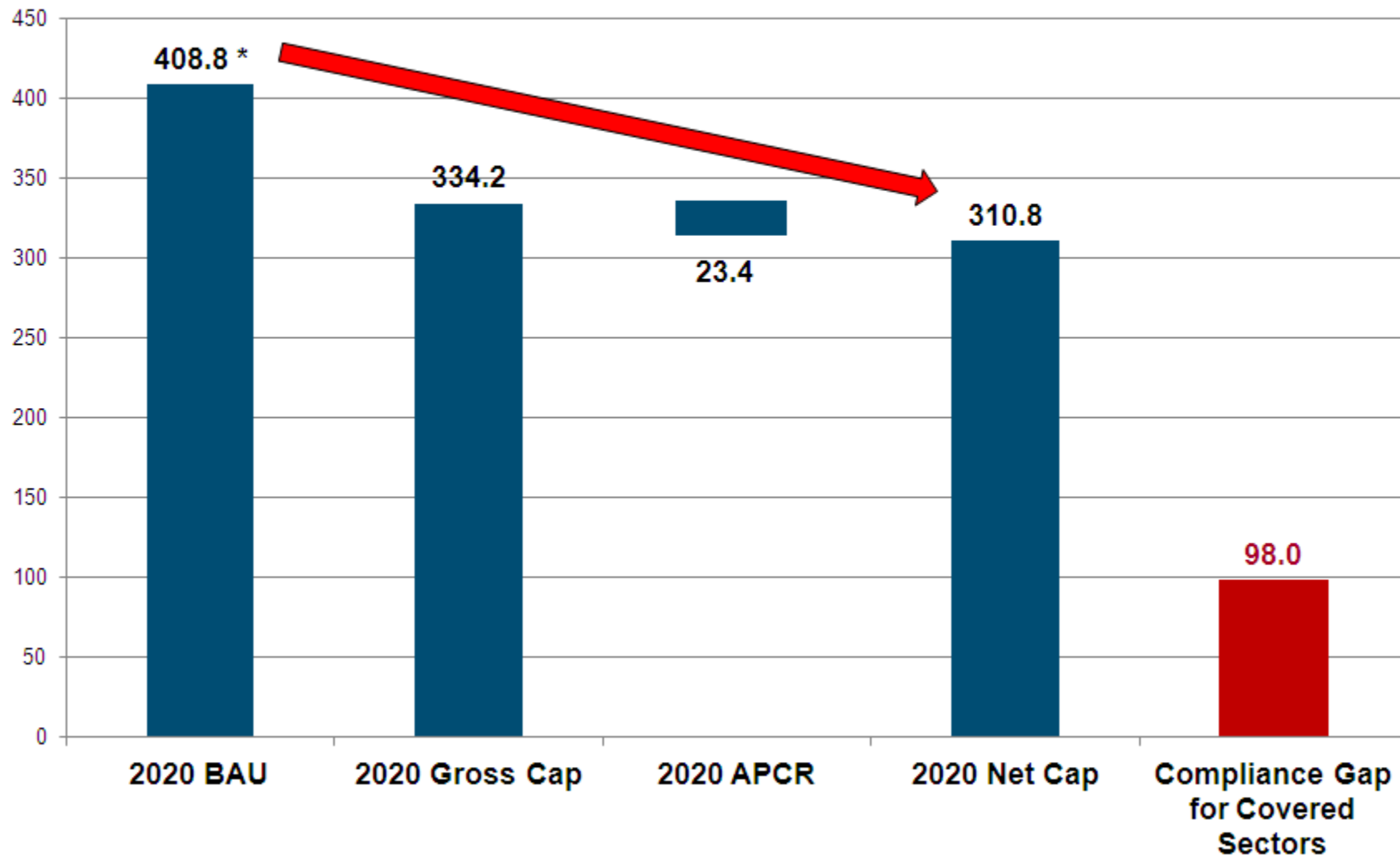
Country	Carbon tax coverage	Rate	Exceptions
Denmark	All energy user, including industrial sector.	Around €13 /ton	Industries are taxed differently depending on process and if they entered voluntary agreement.
Finland	Fossil fuels	€20 /ton. Traffic fuels: €60/ton	Partially exclude energy-intensive industries. Natural gas reduced rate.
Ireland	Kerosene, market gas oil, liquid petroleum gas, fuel oil and natural gas.	€15 /ton	Natural gas exempted for certain use (ex. Electricity).
Netherlands	Carbon based tax on packaging, to encourage recycling. Coal taxation on electricity market.	€21-470, coal tax: €13.37/ton	
Sweden	Carbon tax on gasoline, oil, LPG, natural gas, coal and coke.	Around €100 /ton	Fuel consumption within industry and fuel for electricity generation have exemptions.(EU ETS 100% exempted and non-EU ETS exempted 70%).
Norway	Covers around 64% of Norwegian GHG emissions: gasoline, diesel, mineral oil, and oil and gas used in North Sea extraction activities.	Around €55/ton	Some industries are exempted.
Iceland	Liquid fossil fuel (gas, diesel, oils, petrol, aircraft and jet fuel and fuel oils) electricity and hot water	Fossil fuel: €0.023- 0.032/litre fossil fuel	
Switzerland	All hydrocarbon fuels; coal, oil and natural gas, unless they are used for energy.	Around €30/ton	Companies participating in Swiss ETS are exempted. Gasoline and diesel fuels not included.

Carbon pricing coverage

	EU ETS	California	Australia
Cap, number of CO2/ equivalents (million ton)	2 000 (2013)	334 (2015)	Cap will be announced in May 2014
Coverage of emissions (percentage)	45 %	85 % (2015) 2015 the system will expand its scope	67% (382 Mt of 569 Mt)
Covered sectors	Power and heat generation, energy-intensive industry sectors, commercial aviation.	Electric sector and large industries. From 2015 distributors of transportation fuels natural gas and other fuels.	Landfill waste, off-road transport, industrial processes, fugitive emissions, other stationary energy generation, electricity generation
Reduction target	- 21 % 2020 compared to 2005 levels for EU ETS sectors.	- 9 % 2020 compared to 2005. The overall target is to have same emissions level as 1990.	-5 % economy wide target.
Main policies except emissions trading	Energy efficiency target, renewable energy target.	Low Carbon Fuel Standards (LCFS), Renewable Portfolio Standard and more.	Renewable energy target (20 % renewable electricity).

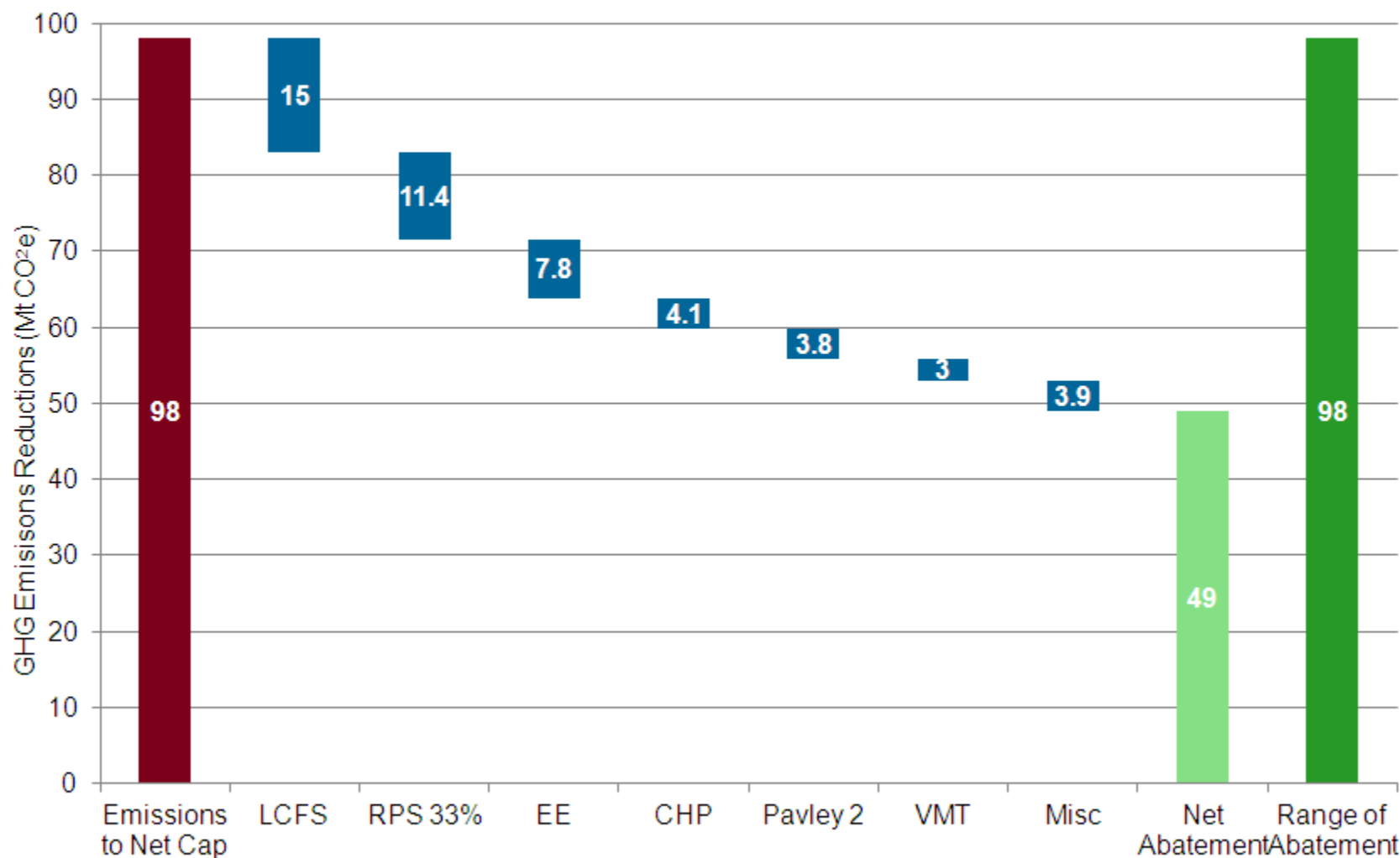
Estimated C&T Compliance Shortfall in 2020

Emissions-to-Net Cap (MtCO₂e)



Source: http://www.arb.ca.gov/cc/inventory/data/tables/2020_ghg_emissions_forecast_2010-10-28.pdf

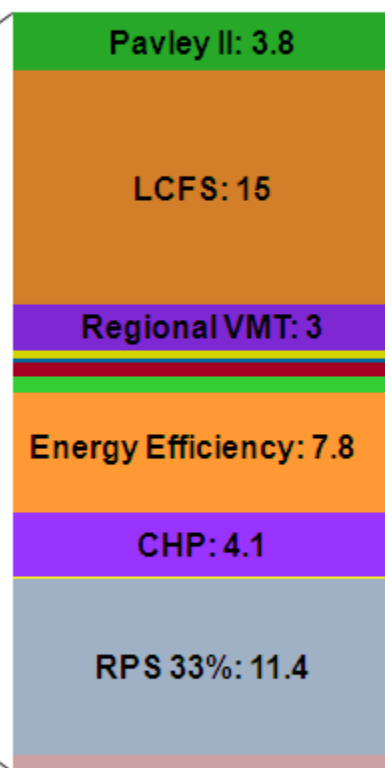
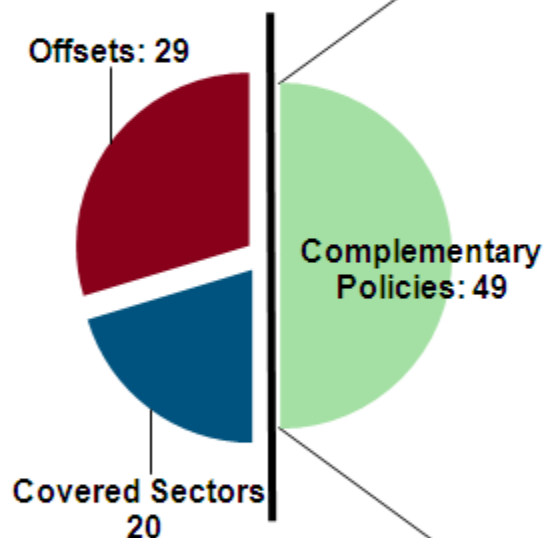
Required GHG Emissions Reductions and Key Role of Complementary Policies in 2020



C&T Base Case Compliance Scenario (Emissions-to-*Net* Cap)

2020

Compliance gap for covered sectors = 98 Mt



- Pavley II
- LCFS
- Regional VMT Targets
- Tire Pressure Program
- Ship Electrification
- Heavy Duty Aerodynamics
- High Speed Rail
- Energy Efficiency and Conservation
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- Solar Hot Water
- Renewable Electricity Standard (20%-33%)
- Million Solar Roofs

Base case assumptions:

- The allowance reserve is not used
- CPs achieve their targets (49 Mt of reductions) (some small reductions not labeled in stacked bar)
- The maximum volume of offsets (29 Mt in 2020) is available
- Covered sector abatement address the remaining gap = 20 Mt
- CPs account for 50% of compliance

Carbon pricing in the EU and around the world

- **EU – 45% of emissions**
 - Overlap with RE and EE
 - ETS price levels matter

- **California – from 2015 - 85% emissions**
 - Overlap with MANY complementary policies
 - ETS price impacts small amount of reductions
 - ETS price is not a concern

- **Australia – 65%**

Role of carbon pricing EU ETS – what is expected of it ?

Catalyze:

- **Technology development**
- **Change in societal trends**
- **Price signal for deployment of low carbon technologies**
 - MT e.g. wind
 - LT e.g. CCS
- **Changes at operational level**

What can Pricing do ?

- **Can it do it all ?**
- **Can it do it all alone?**
- **What characteristics does it need to do each task?**

- **Operational role: arbitrage between primary energy source dispatch**
 - ST
 - Can do function of
 - Energy prices level
 - ST Carbon price signal

- **Deployment of low carbon technologies**
 - MT
 - Can do function of
 - Credibility of price signal
 - Clarity of price signals
 - Consistency of prices signal
 - Carbon prices level

- **Catalyze technology development**

- LT
- Carbon price credibility provides a signal but no incentive unless very high
- Policies and measures need for research and innovation

How to address competitiveness (1)

- **Free allocation and compensation ?**
- **Carbon credits and linking of markets ?**
- **Innovation policy ?**
- **Carbon border measures ?**

Question: What combination?

Other tools and instruments (1)

- **Power sector performance standards give a very powerful signal to low carbon generation?**

Questions:

- (1) Are performance standards acceptable to power sector?
- (2) Are they acceptable to member states? Nuclear?
- (3) Can they be designed in an efficient and effective way?
- (4) What role for ETS then?

Other tools and instruments (2)

- **There is consensus that the low-carbon economy requires new (low-carbon) infrastructure. Yet public money is scarce to non-existent (see MFF)**

Questions:

- (1) **What new finance models can be developed?**
- (2) **What framework will they require? See Smart Cities**

- **There is equally consensus that post-2020 climate policy needs requires an innovation pillar. The SET-Plan was the EU answer.**

Questions:

- (1) **Is the SET-Plan approach the right approach, i.e. is 'only' the money missing?**
- (2) **Where should the money come from?**