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Energy Efficiency Obligations:
Global Experience and Design Options

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Current Issues in DSM
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Regulatory Assistance Project (RAP)

RAP is a global, non-profit team of experts providing technical and policy assistance to government officials on energy and environmental issues. RAP has advised governments in more than 30 nations and 55 states and provinces.

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A member of the IEA DSM Executive Committee, he served 12 years as Chair of the Vermont PSB (utilities regulator), Chaired the US regulators' Committee on Energy & Environment, and the National Council on Competition and the Electric Industry. He is an advisor to the New York Independent System Operator, and Chair of the Electricity Advisory Committee of the US Department of Energy.

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Major points today

1. **"Energy Efficiency First" --** Energy efficiency resources deliver multiple benefits – to energy security, power prices, business competitiveness, consumer savings, job creation & the environment. EE is Europe's overlooked energy resource.
2. **Energy efficiency obligations/white certificates (EEOs) are powerful tools to deliver efficiency benefits**
3. **A variety of EEO structures and approaches are working well in the US, EU, AUS, China, Canada, elsewhere –** Obligations on retail providers, wires/pipes companies, government agencies, special efficiency agencies, and others
4. **Key features of successful EEOs:** Growing ambition; clear obligation; stable source of revenue; consumer protection, and good measurement tools.

Why do we need Efficiency Obligations?

- Energy waste drives up energy prices, total energy costs, and is a non-productive drag on national economies.
- But Energy Efficiency (EE) does not occur to the extent that “the rational economist” would predict, due to a host of market and consumer barriers .
- Market barriers are high in both regulated and liberalised energy markets.
- Mandates are needed for EE, just as for fuel poverty supports, carbon regulation, and renewables obligations/ feed-in-tariffs.
- **GOOD NEWS -- EE mandates will lower system costs and lead to LOWER BILLS :**
  - **In the EU, 20% energy savings by 2020 saves (net) 78 Billion EUR per year** (Ecofys-Fraunhofer 2010)

Why EEOs on *Energy Providers*?

- **EEOs put the responsibility for energy efficiency on the actors in the sector directly connected to the purchase and sale of energy**
- **Consumers need help to invest –** (audits, advice, financing, incentives, etc.) **Energy providers** can overcome barriers, work directly with consumers, or support those who do.
- **Energy providers are a logical and stable source of revenues:** avoiding ups and downs of annual public funding and providing incentives for efficient delivery.
- **Energy providers also have key roles in other parts of an EE policy package –** codes and standards, consumer education, financing, smart metering and tariff reform.
- **HOWEVER: Global experience shows other approaches work too.** (Member States can take different approaches under EED Article 6)

EEOs & White Certificates (WCs)

- Whether called EEOs or WCs, programs in the EU operate on the same principle –
  - ***A public mandate*** requires an ***energy provider*** to prove their activities have resulted in ***energy efficiency improvements*** by eligible ***end use customers***
- In some systems installers can earn a White Certificate for the energy savings achieved – not necessarily tradable
- ***Openly tradable WCs*** -- when parties other than the obligated energy providers can earn WCs in their own right and trade them in the market place. (Really only in Italy and Texas; limited trading in France, China)

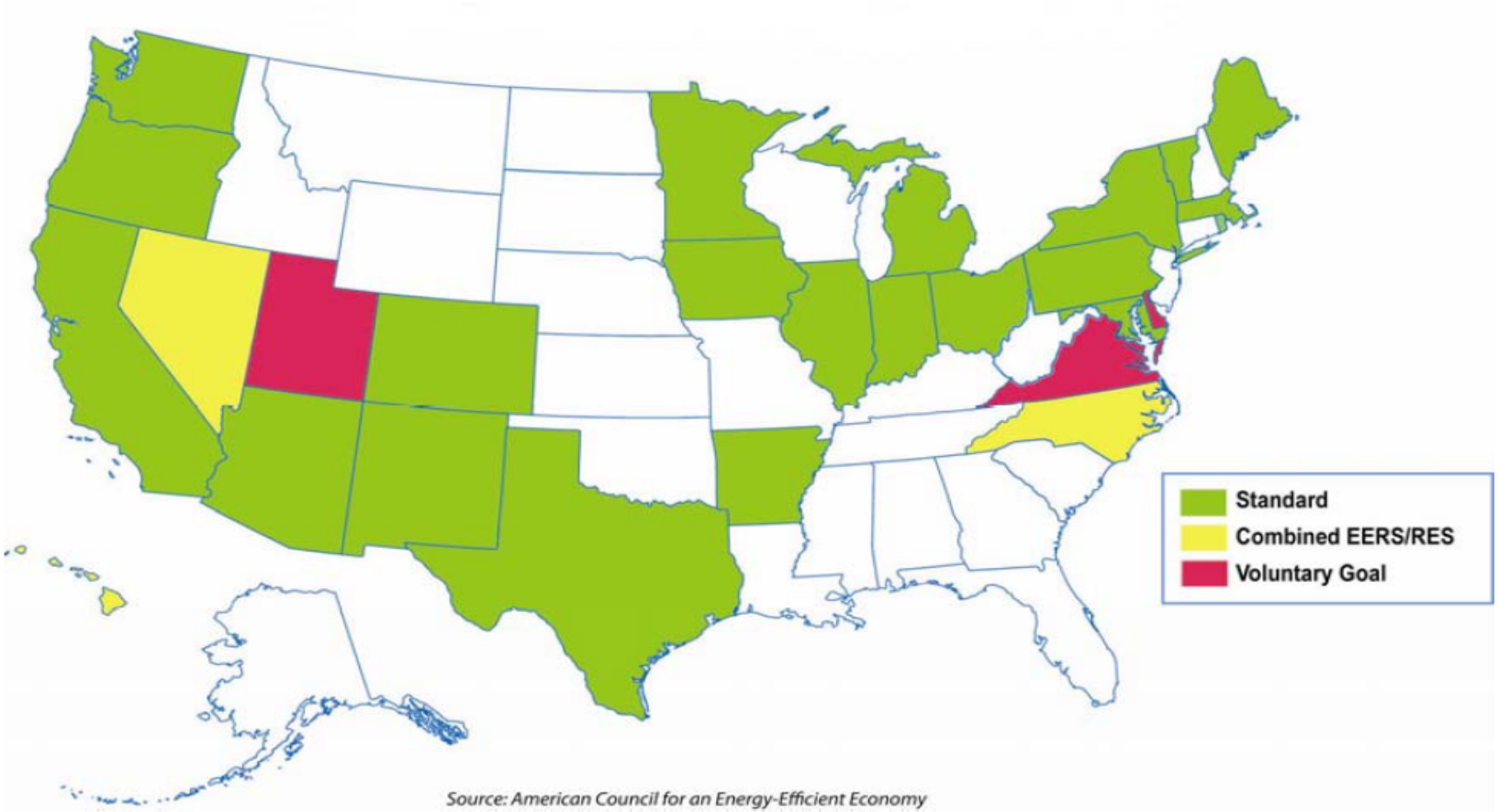
Global Experience with EEOs

- Europe: 7 Member States or Regions
  - UK, France, Italy, Denmark, Flanders (changing), Ireland & Poland (starting)
- 24 US States ("EE Resource Standards")
- Australia: 3 largest States -- New South Wales, Victoria, South Australia
- China: "Efficiency Power Plants"
- Brazil: 1% for public purposes, ½% for EE
- Other nations acting: Canada, Mexico, India

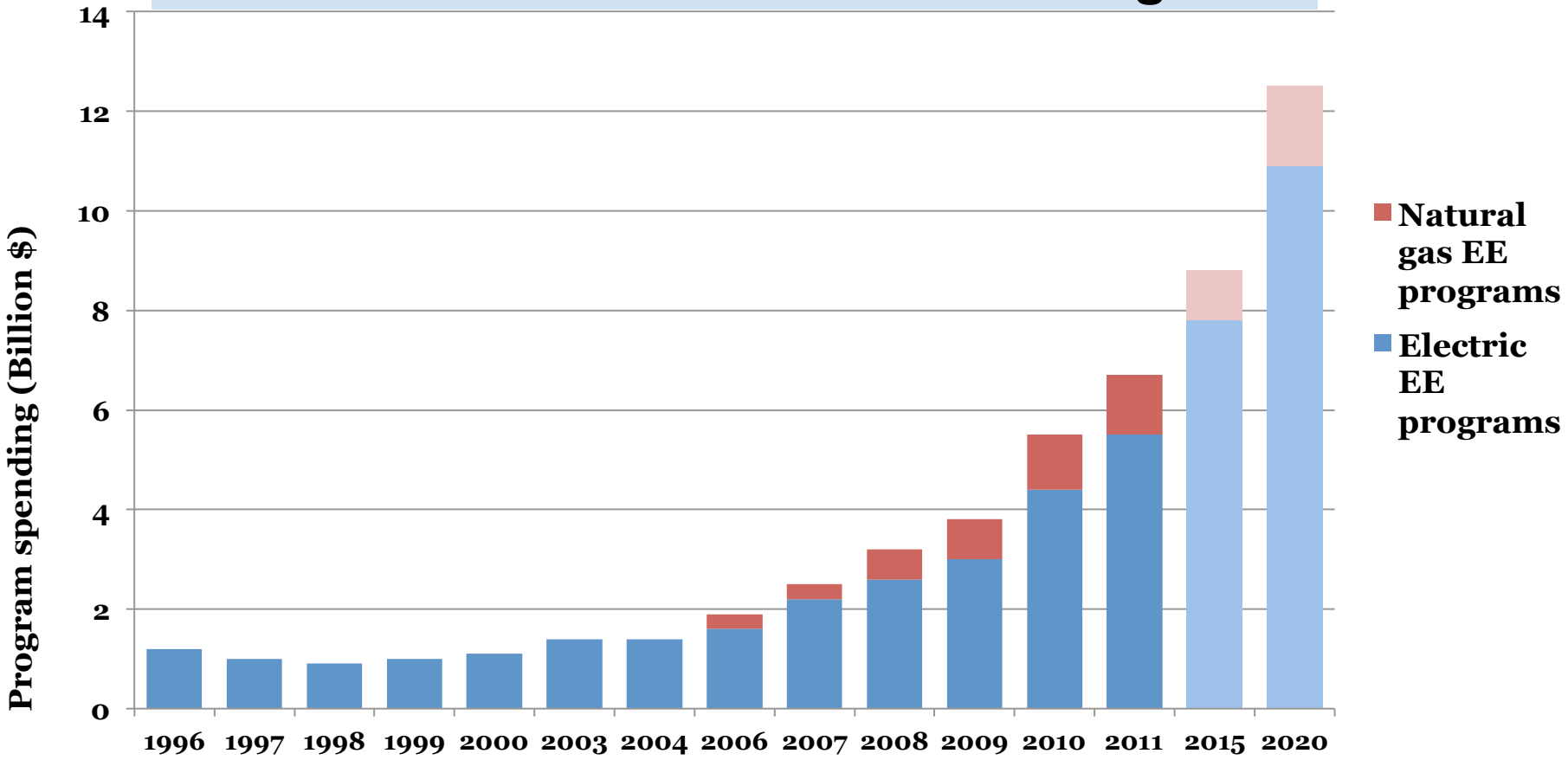
US - 24 US States with EEOs

State Energy Efficiency Resource Standard (EERS) Activity

October 2011



U.S. Utility EE Program Spending Now Over $7 Billion/Year and Still Growing



Note: 1993 - 2008 represents spending; 2009 represents spending among CEE members reporting to CEE; 2010 and 2011 represent budgets of CEE members reporting to CEE; 2015 and 2020 represent LBNL "high case" projections

Sources: ACEEE, The 2010 State Energy Efficiency Scorecard, October 2010; CEE, *State of the Efficiency Program Industry*, December 10, 2010, and March 14, 2012; LBNL, *The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.* , 2009.

EE Obligations in China

- China's 12th Five Year Plan (2011 – 2015) requires
  - **16% reduction in energy intensity over five years**
  - **17% reduction in carbon intensity**
  - Major pollutants emission reduction of 8-10%
- These are ***mandatory***
- New DSM Rule (2011) requires distribution companies to deliver incremental 0.3% efficiency savings annually
- **China spending on EE: between 3% and 4% of total system revenues** (about 1.2% is through utilities, rest is direct government spending)

Who's Obligated? - Approaches vary in Europe, North America, Australia

1. Obligation on regulated distribution utility
   Italy; Denmark; most US states, including California; Ontario
2. Obligation on competitive retail suppliers
   Great Britain, France, Ireland; 3 Australian states
3. Obligation funded by levy on distribution companies but borne by a state agency
   Oregon, & New York (partially)
4. Obligation funded by levy on distribution companies but borne by an independent "Energy Efficiency Utility"
   Efficiency Vermont; *Efficiency Maine*
5. Performance Contracting with 3rd parties (other than the obligated entities) *Texas, New Jersey*

EU Experience with EEOs

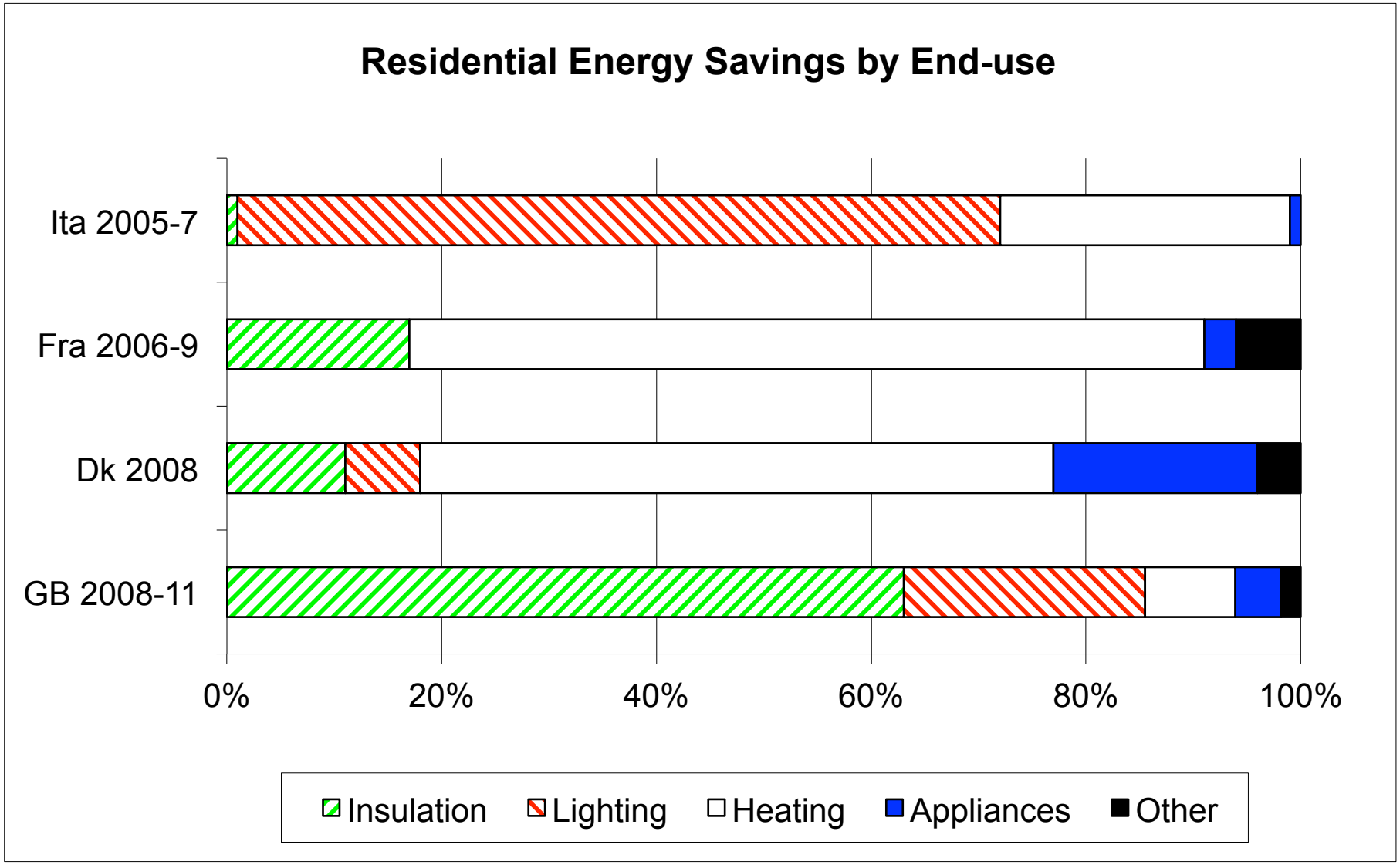
(Up to 2011)

Country	Obligated Company	Eligible Customers	Administrator
Belgium - Flanders	electricity **distributors**	residential and non energy intensive industry and service	Flemish Government
France	**retailers** of non-transport energy + **importers** of road transport fuel	All (including transport) except EU ETS	Government
Italy	electricity & gas **distributors**	All including transport	Regulator (AEEG)
GB	electricity & gas **retailers**	Residential only	Regulator (Ofgem)
Denmark	electricity, gas, fuel oil & heat **distributors**	All except transport	Danish Energy Authority

EEOs in the EU – MS Choices on Targets, Ambition, Spending (2011 data)

Country	Nature of saving target	Current size of target	Estimated annual spend by companies €M {€/person}
Belgium – Flanders	1st year primary energy	0.6 TWh annual	60 {14}
France	lifetime delivered energy	345 TWh over 3 years to end 2013	340 {5}
Italy	cumulative 5 year primary energy	5.3 Mtoe in 2011	530 {9}
GB	lifetime CO2	293 MtCO2 in 4.75 years to end 2012	1440 {24}
Denmark	1st year delivered energy	6.1 PJ annual	100 {18}

EU EEOs – Where do the savings come from?



Why such big differences across these national schemes?

UK: has a relatively old and poorly insulated housing stock whose construction (cavity walls) allows relatively cheap wall insulation

Italy: Prices of CFLs fell dramatically so Italian distributors were able to achieve energy savings from CFLs at ~1/3rd original cost estimate

Denmark: has extensive district heating schemes

France: Government tax breaks for new boilers meant boilers were a relatively “cheap” sale for energy companies

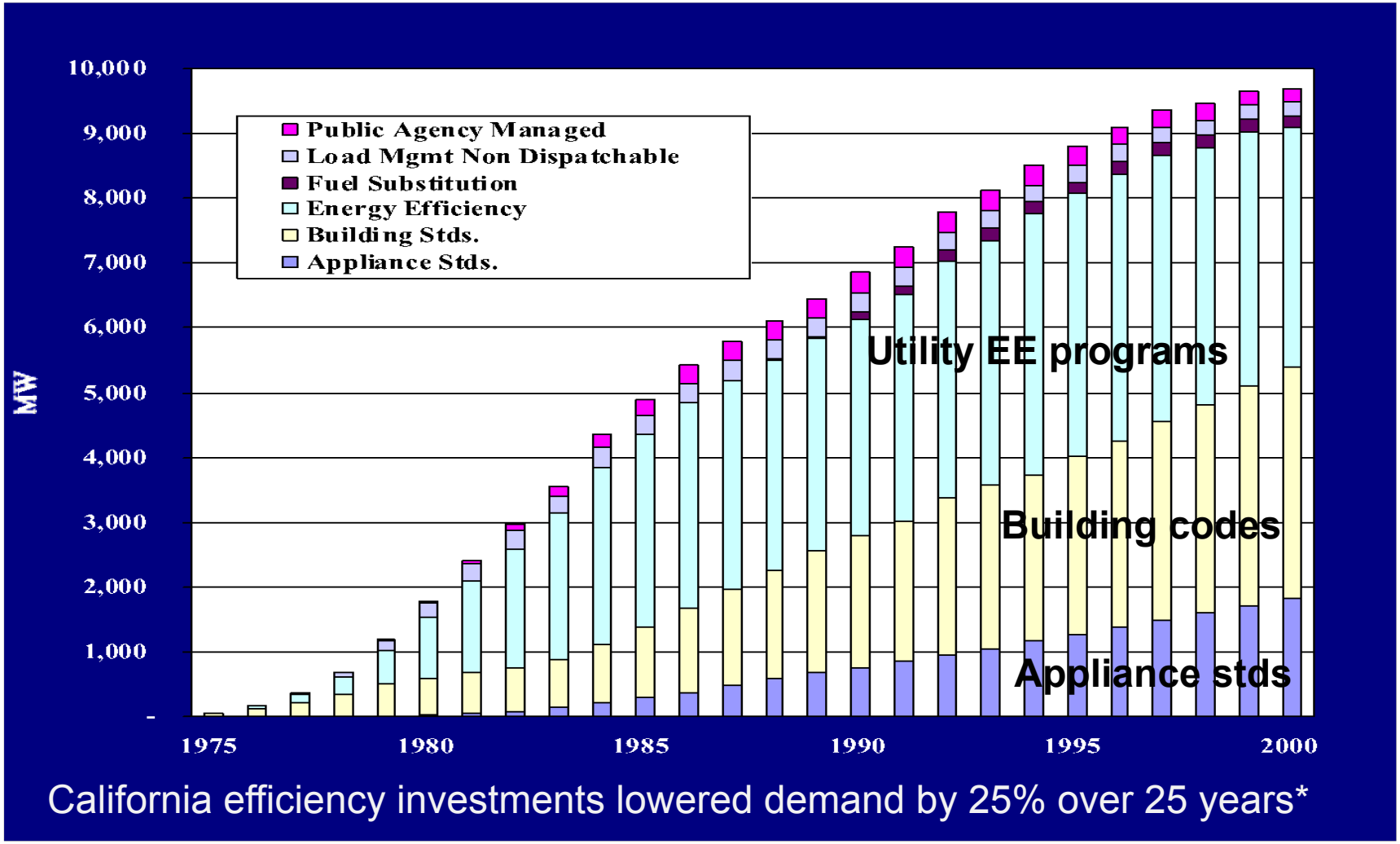
Globally, EEOs are highly cost effective

- **US state EEOs** save electricity for 3-4 US cents/kWh compared to 6-9 cents per kWh for generation cost alone.
- **EU experience**: saving residential electricity or gas costs less than 25% of the cost of that fuel to the consumer.
- **PLUS: EE also saves** on transmission and distribution upgrades, lowers reserve margins and line losses, has no emissions, improves reliability, lowers peak loads.
- **"Merit Order Effect":** In competitive power markets, lower demand also **lowers clearing prices for all consumers –** not just consumers who save energy.
  - In some cases, this effect alone can justify the entire cost of the program

Strong programs add 2% incremental savings per year

- **Energy savings add up, can become one of the largest energy resources in the economy.**
- **Some obligations now in place:**
  - New South Wales: growing to save 34% in 11 years
  - New York -2% per year by 2015
  - Arizona: -2% annually, over 20% in 10 years
  - Illinois: -2% annually, 2015-2022
  - Massachusetts: -2.3% per year through 2020
- **Leading programs spend 3% to 5% of system revenues on energy savings (and save more)**

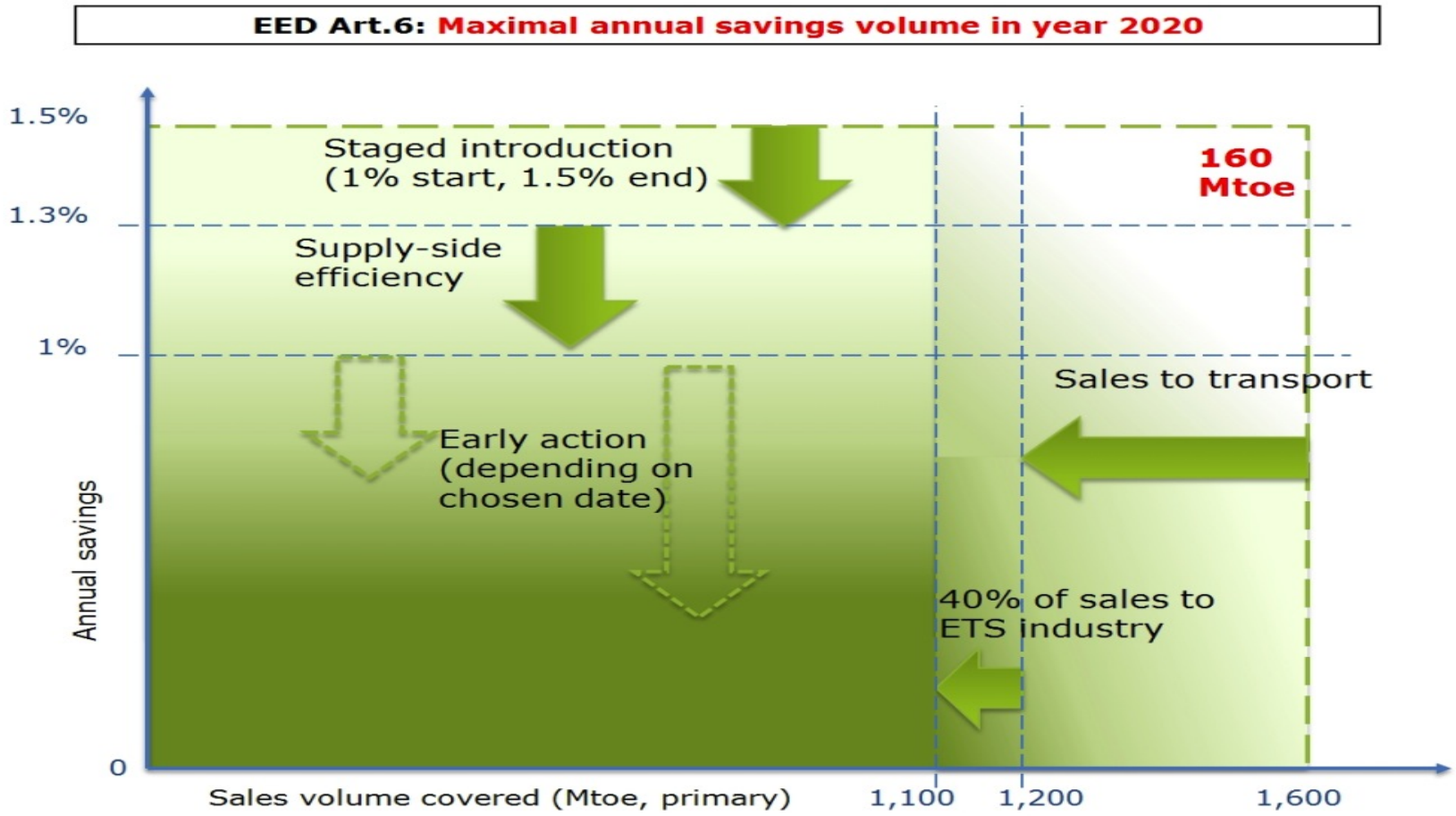
EE savings grow over time; utility programs are *in addition to* other public policies (California example)



California efficiency investments lowered demand by 25% over 25 years*

*and then were expanded

Which uses are covered, which savings count – can greatly affect EEO achievement*



*example for EED from Coalition for Energy Savings April 2012

EEO Impact on Energy Demand – GB example

- Lets use GB data which has largest and longest running EEO in Europe --
- In GB, natural gas provides 80% of all heating & hot water; prior to 2005 residential gas demand increased at between 1-2% per year. In 2005, 3 events:
  - EEO obligation doubled (72% of delivered energy savings in EEO come from insulation measures in gas households);
  - New regulations on boiler replacements meant condensing boilers quickly moved from 36% of the replacement market to >97%; and
  - Gas price rises for residential customers reduced demand

Evidence that EEOs can work (GB con't)

Tracking 4 million customers over the next 5-year period (2006-10), British Gas found:

Average household consumption fell by 22% over the period --

- Annual fall was 4.9% compounded
- **Direct result of EE measures (mainly insulation and heating): reduction of ~ 3.3%/year**
- Consumer behaviour, lifestyle changes also reduced demand to a lesser extent.

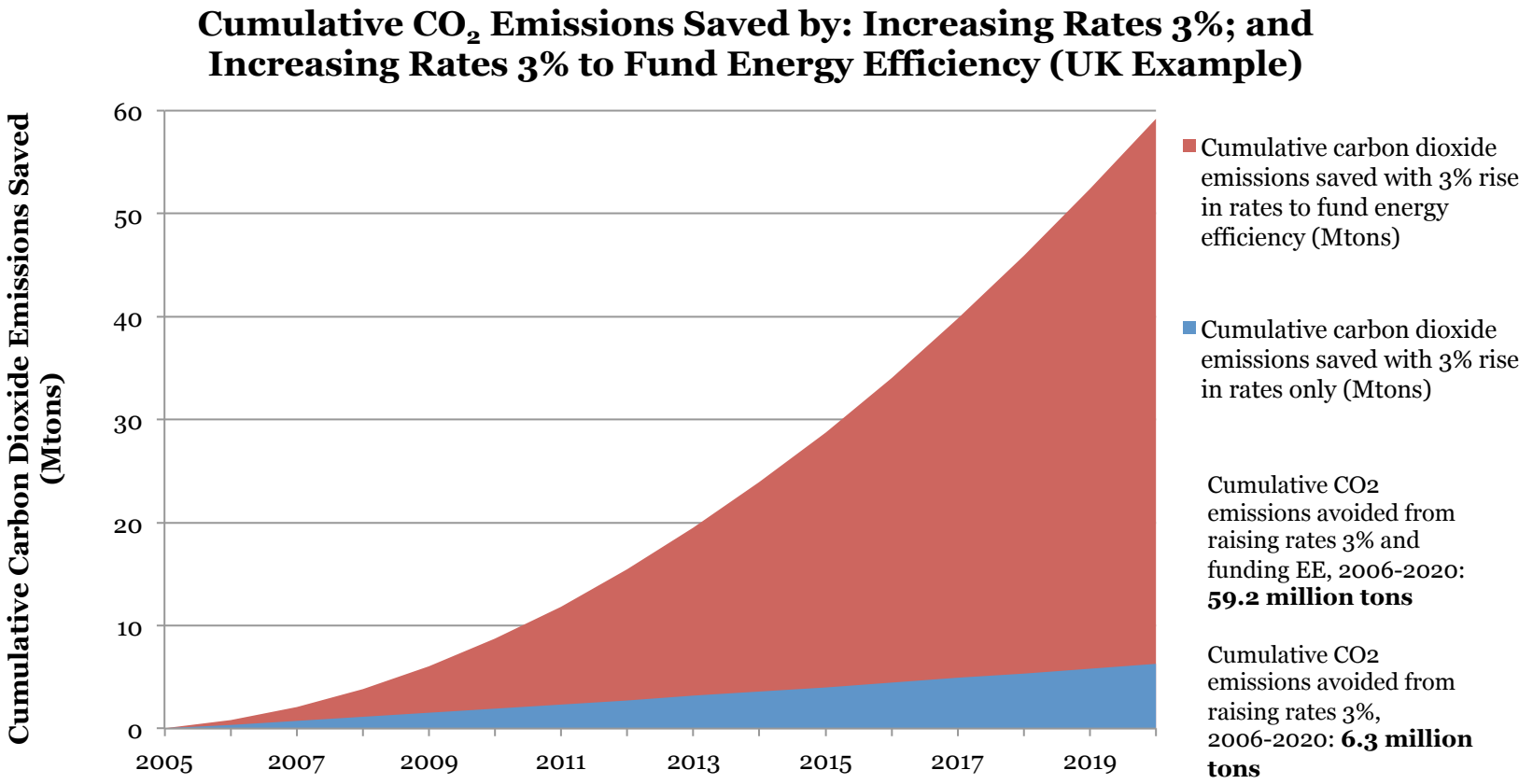
Carbon Markets Can Finance Energy Efficiency and Economic Growth

- Key idea: Sell allowances, invest carbon revenue in low-cost carbon reduction -- especially EE
- **Northeast US: 10 RGGI states** now dedicate >80% of allowance value to clean energy (~55% to EE)

- **Even with low (~$3/ton) CO_2 prices, RGGI has raised over $500 Million for EE programs – avoiding CO2 at a cost of (minus) $-73 per ton !**
- **So far: Adding $1.6 Billion to the regional economy, and supporting 16,000 new jobs**

- **Germany** – carbon revenues will go to KfW Bank, which finances EE building retrofits

Efficiency programmes save 9x more carbon per consumer GBP than carbon taxes or prices



Conclusions from global & EU experience

- EEOs have been successful policy tools in a variety of markets and geographic regions
- Obliged entities and administrative models can be tailored to state or national conditions
- Many states (US and AUS) and EU MSs have evaluated their programmes and expanded them
- EEOs can deliver advantages of EE to energy systems, consumers, and economies without relying on Treasury funds
- **Key features are: Clear mandate, growing ambition, stable funding, and accountability for results.**

Questions?

For more information, visit the RAP website:

- *Energy Savings 2020: How to Triple the Impact of Energy Saving Policies in Europe (Ecofys and Fraunhofer Isi, 2010)*
- *Determining Energy Savings for Energy Efficiency Obligation Schemes (D Staniaszek & E Lees, 2012)*
- *Energy Efficiency Feed-in Tariff: Key Policy and Design Considerations (C Neme & R Cowart 2012)*
- *Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes (D Crossley, RAP and IEA, in press)*
- *Prices and Policies: Carbon Caps and Efficiency Programmes for Europe's Low-Carbon Future (R Cowart 2011)*