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Energy Efficiency Obligations:
Global Experience, Design Options for Europe

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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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Major points today

1. **"Energy Efficiency First" --** Energy efficiency resources deliver multiple benefits – to energy security, power prices, competitiveness, job creation & the environment.
2. **Energy efficiency obligations/white certificates (EEOs) are powerful tools to deliver efficiency benefits –** Obligations are needed to meet national and EU targets
3. **Different EEO structures and approaches are working well in the US, EU, AUS, China, Canada, elsewhere –**

   EU Member States can design an EEO to meet national goals
4. **Key features of successful EEOs:** Growing ambition; clear obligation; stable source of revenue; consumer protection, and good measurement tools.

EEOs & White Certificates (WCs)

- Whether called EEOs or White Certificates, programs in the EU operate on the same principle –
  - A ***public mandate*** requires an ***energy provider*** to prove its activities have resulted in ***additional 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 and trade them in the market place. (Really done only in Italy and Texas; limited trading in France, China)

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 renewable power, fuel poverty supports & carbon regulation.
- **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 could take different approaches under EED Article 6 – eg, Pooled Funding, programs like the KfW Bank, Efficiency Power Plants)

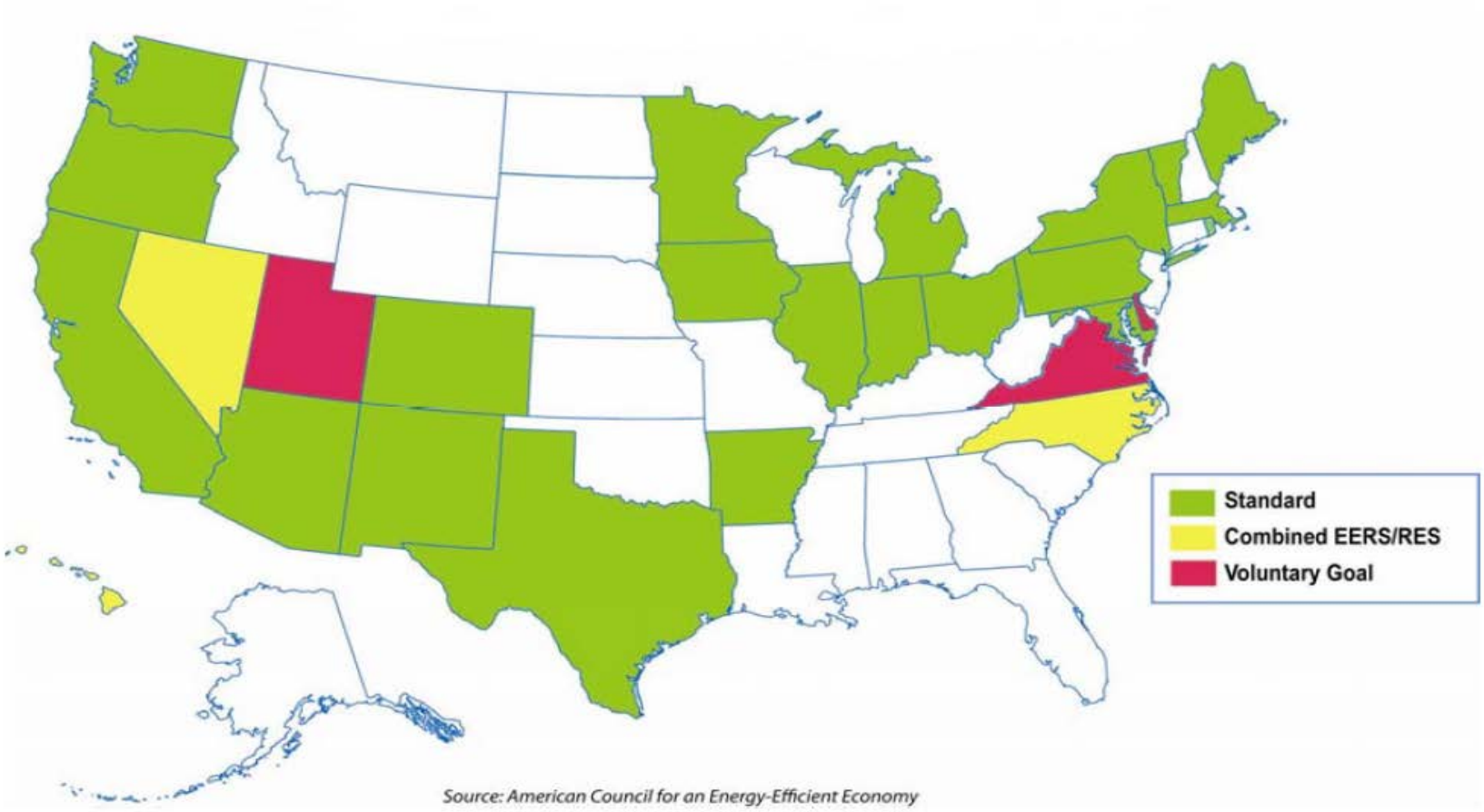
Global Experience with EEOs

- Europe: 7 Member States or Regions
  - UK, France, Italy, Denmark, Flanders (changing), Ireland & Poland (starting)
- 24 US States: 70% of US electric load
- 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

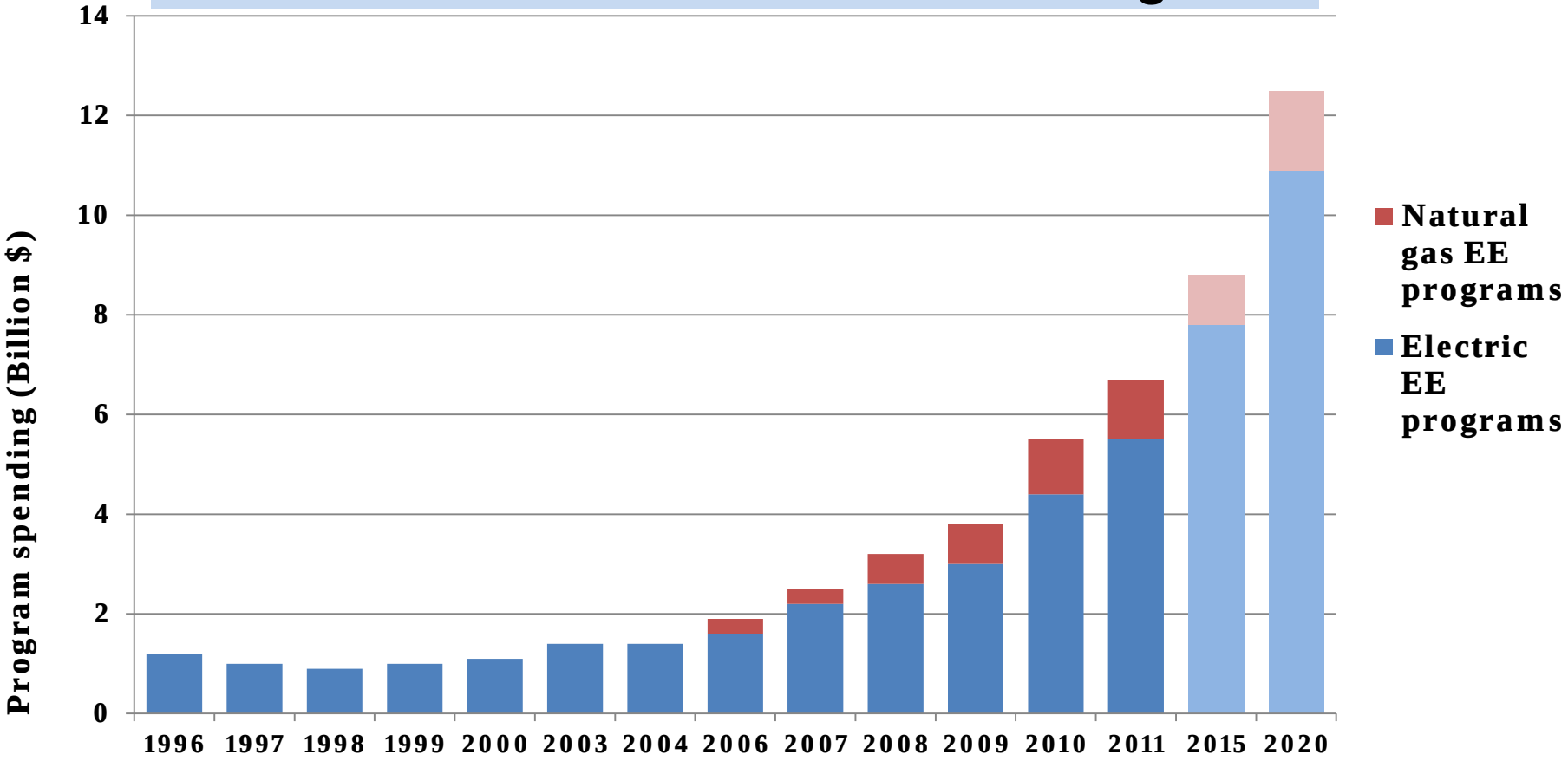
US - 24 US States with EEOs

State Energy Efficiency Resource Standard (EERS) Activity

October 2011



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



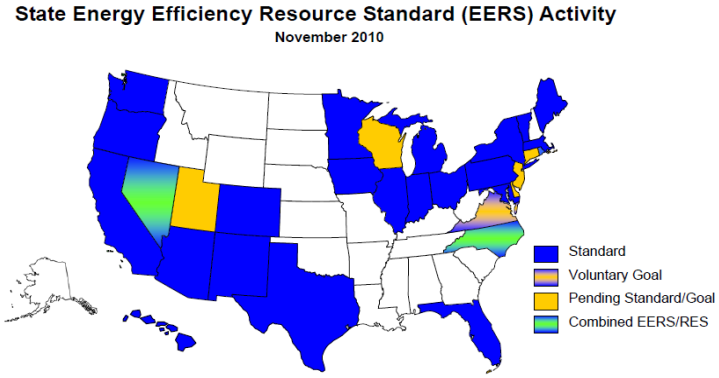
Note: 1993 - 2008 represents spending; 2009 represents spending among CEE members reporting to CEE; 2010 and 2011 represent budgets of CEE members reporting to CEE; 2015 and 2020 represent LBNL "high case" projections

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.

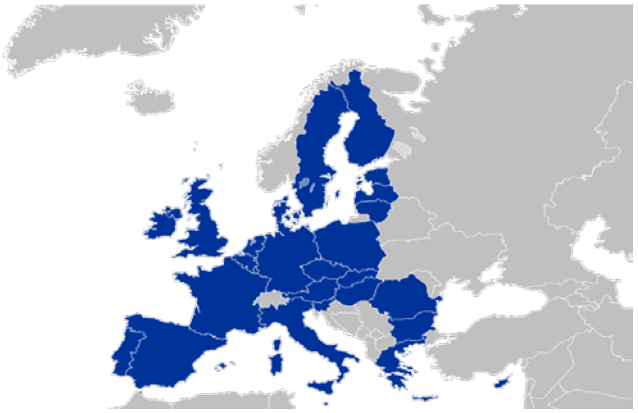
EE Obligations in China

- 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%
- New DSM Rule (2011) requires distribution companies to deliver efficiency
- **China spending on EE: between 3% and 4% of total system revenues** (about 1.2% is through utilities, rest is direct government spending)
- By 2020, DSM Rule is expected to displace **150 GW** peak load = 300 500-MW coal plants across China

LESSONS FROM EU & GLOBAL EXPERIENCE



Twenty-four states have enacted energy savings goals, or Energy Efficiency Resource Standards (EERS), through legislation and several states have a pending EERS



1. Who's Obligated? – A range of successful approaches are in place

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

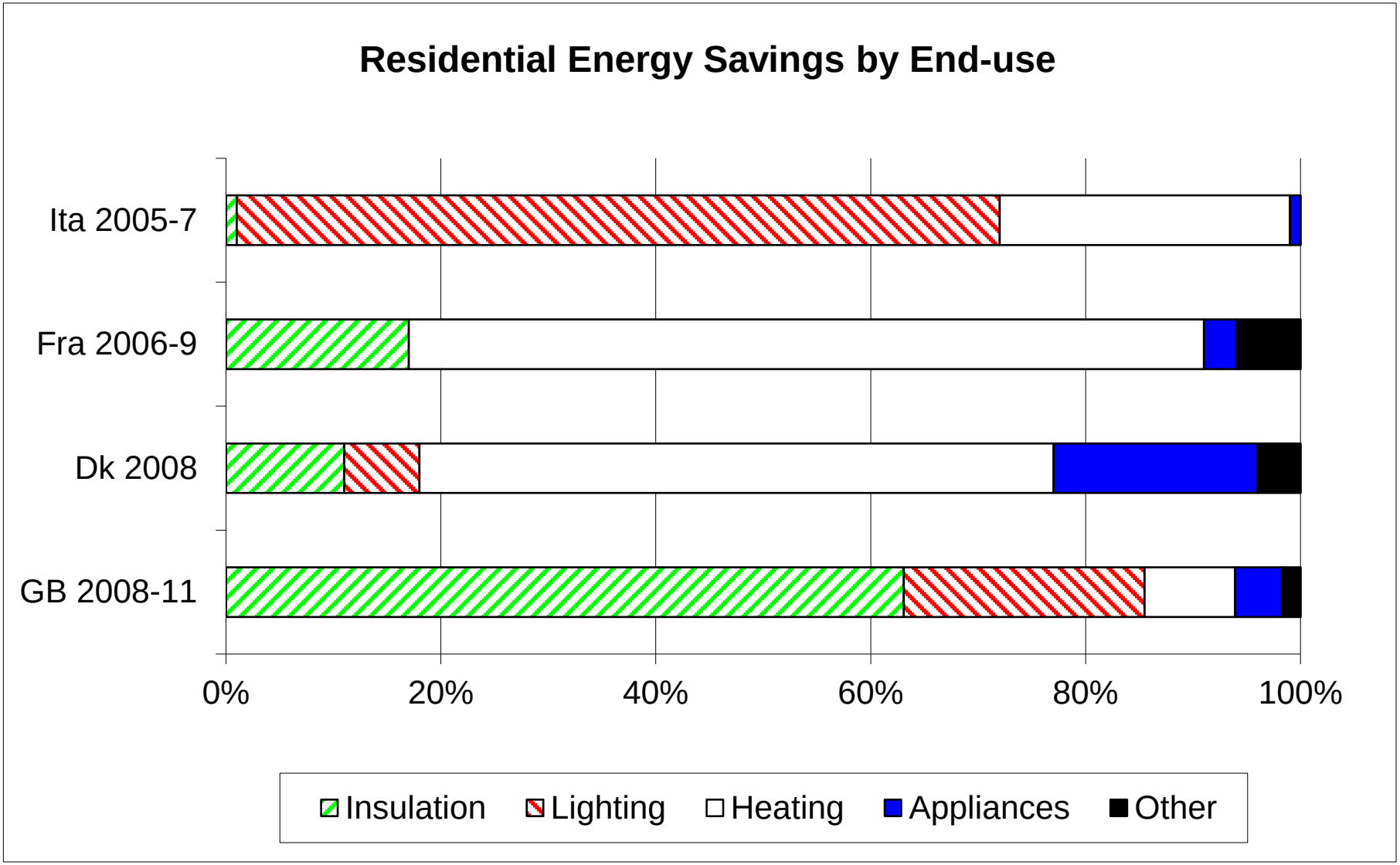
(Up to 2011)

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

2. What Sectors? – 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 EUR/person}
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 EUR/person}
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 incentives for new boilers made boilers an early target for energy companies

LESSON: Each MS scheme can focus on national priorities and opportunities

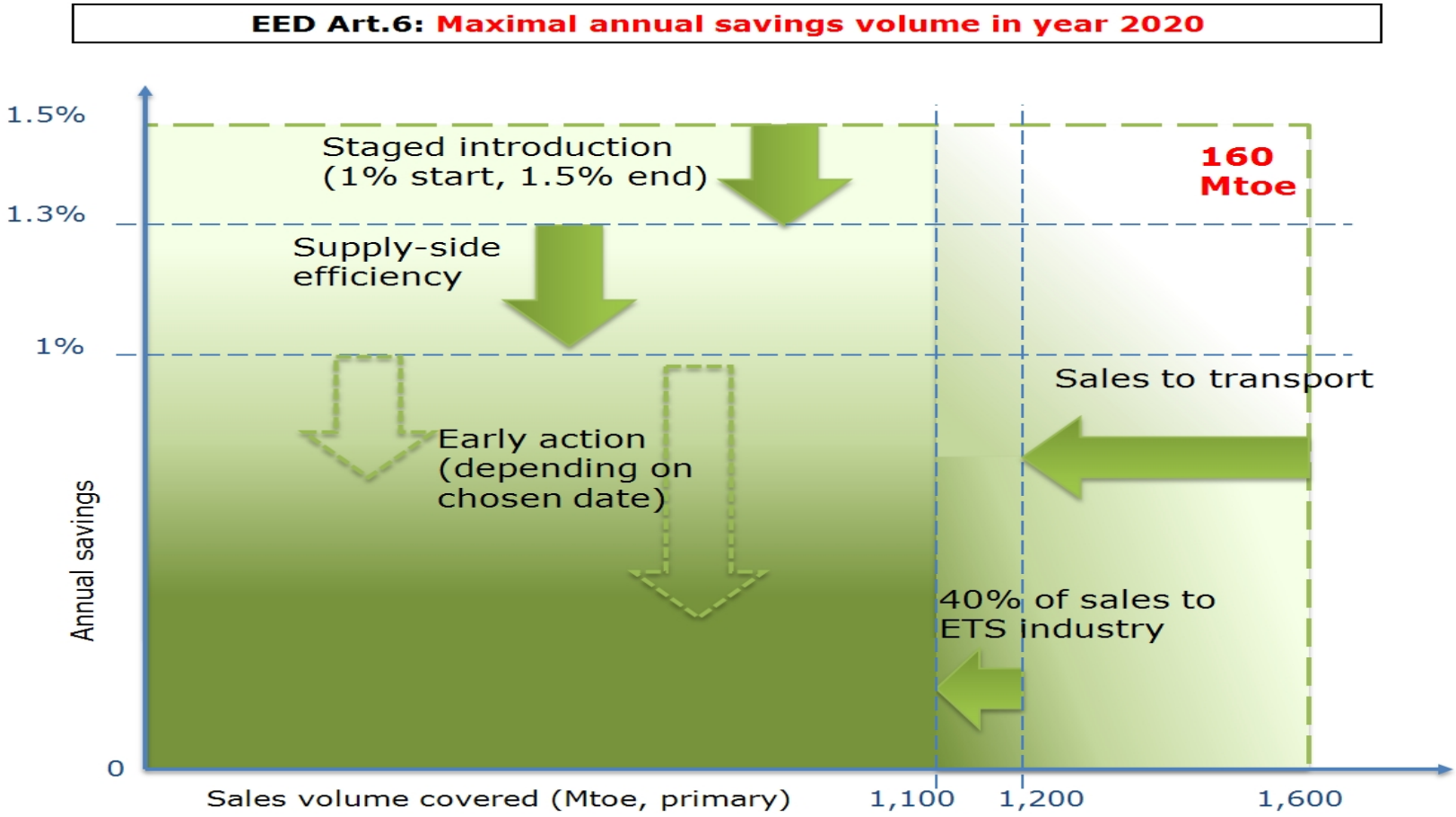
3. Globally, EEOs are highly cost effective

- **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 EE program

4. Strong programs add 2% incremental savings per year

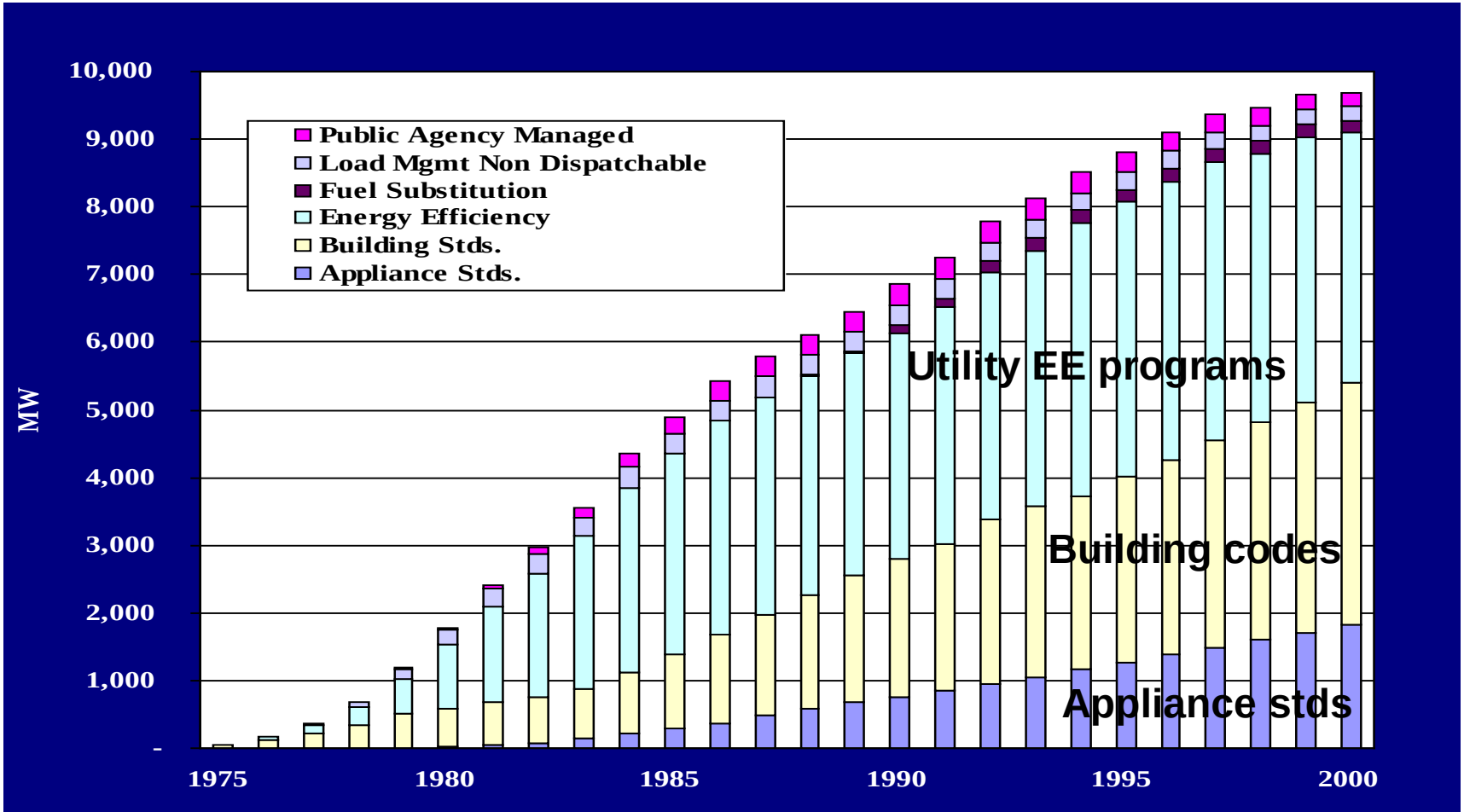
- **Energy savings add up, can become one of the largest energy resources in the economy.**
- **Some obligations now in place:**
  - New South Wales: growing to save 34% in 11 years
  - New York -2% per year by 2015
  - Arizona: -2% annually, over 20% in 10 years
  - Illinois: -2% annually, 2015-2022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

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



*example for EED from Coalition for Energy Savings April 2012

5. **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

6. EEO Savings Can Be Quite Large – 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:
  - **EEO obligation was 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 --

- **Most was a 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.

Conclusions from global & EU experience

1. EEOs have been successful policy tools in a variety of markets and geographic regions
2. Obliged entities and administrative models can be tailored to national conditions
3. Many states (US and AUS) and EU MSs have evaluated their programmes and expanded them
4. EEOs can deliver advantages of EE to energy systems, consumers, and economies without relying on Treasury funds
5. **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)*