



MORNING PLENARY SESSION

Accelerating Energy Productivity: Is Doubling Energy Productivity by 2030 an Achievable Goal?





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CEO & Founder

Climate Strategy & Partners

@ClimateSt





”Accelerating Energy Productivity: Is Doubling Energy Productivity by 2030 an Achievable Goal ?”

Presented by Peter Sweatman, CEO of Climate Strategy & Partners
Rapporteur for G20.IPEEC EEFTG and Europe’s #EEFIG

13th May 2015, EEGlobal



CLIMATE & STRATEGY
P A R T N E R S

IPEEC & its G20 Energy Efficiency Mandate



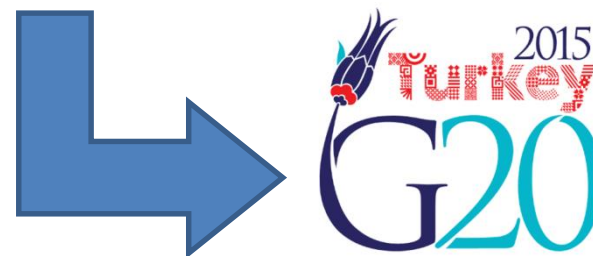
Brisbane Platform



Six Workstreams

- Vehicles
- Products: Networked devices
- Finance: EEFTG
- Buildings
- Industrial energy management
- Electricity generation

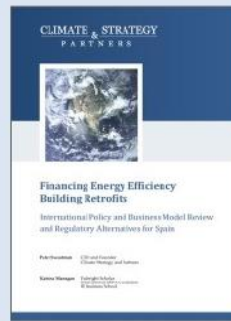
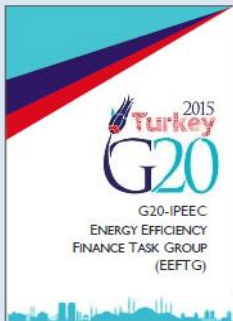
*“The International Partnership for Energy Efficiency Cooperation (IPEEC) is an **autonomous international forum** that provides **global leadership on energy efficiency** by **facilitating government implementation of policies and programs to yield energy efficient gains**”*



“ Energy efficiency investing has a fundamental and beneficial role to play in the transition towards a more competitive, secure and sustainable energy system with an internal energy market at its core ”

Peter Sweatman CEO of Climate Strategy - EFIG Launch Feb 26th 2015

Climate Strategy leads in Energy Efficiency Finance with 8 white papers written in the past 6 years and supporting international policy initiatives



Climate Strategy understands the interdependent relationships between:

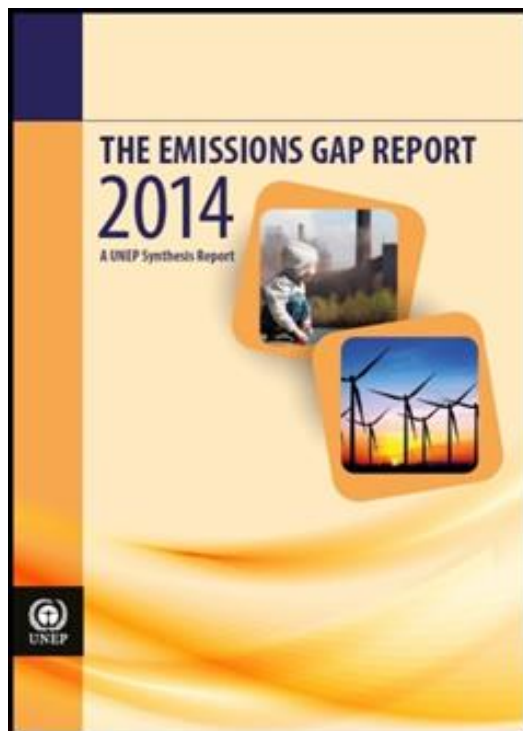
- **Environment**
- **Business**
- **Society**
- **and Government**

and their roles in guiding the **global transition to a low carbon economy**

190 key note speeches and public conferences on the Transition to a Low Carbon Economy and 90+ press articles, Climate Strategy is working for a Climate Deal at COP21

Follow us @ClimateSt

What does the UN say about EE potential ?



Report is based on contributions from 38 lead scientists from 22 research groups in 14 countries.

“Global energy intensity improved by 1.6% annually between 2002 and 2012” – ie. cumulative **17.2%** improvement in 10 years.

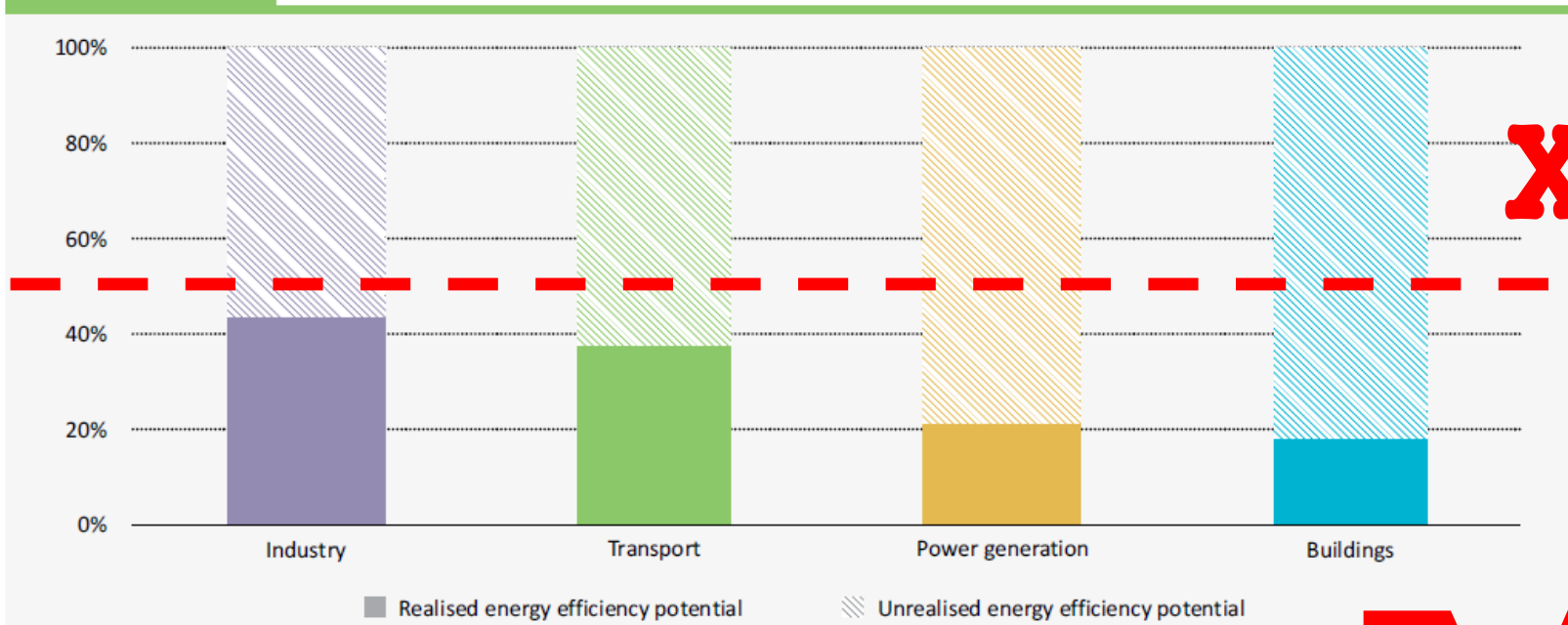
Between 2015 and 2030, energy efficiency improvements worldwide **could help avoid 22–24 Gt CO₂e (or 2.5–3.3 Gt CO₂e annually in 2030)** of emissions relative to a baseline scenario and assuming a carbon price of US\$ 70 / tonne. This corresponds to a **reduction in primary energy demand of about 5–7 per cent”**

Improving energy efficiency comes with **substantial multiple benefits**. Not only does it reduce or avoid greenhouse emissions, but it has long been considered a main way to increase productivity and sustainability, primarily through the delivery of energy savings. Moreover, energy efficiency measures can **contribute to economic growth and social development** by increasing economic output, employment and energy security.”

What does the IEA say about EE potential ?

Figure 1.3

Long-term energy efficiency economic potential by sector

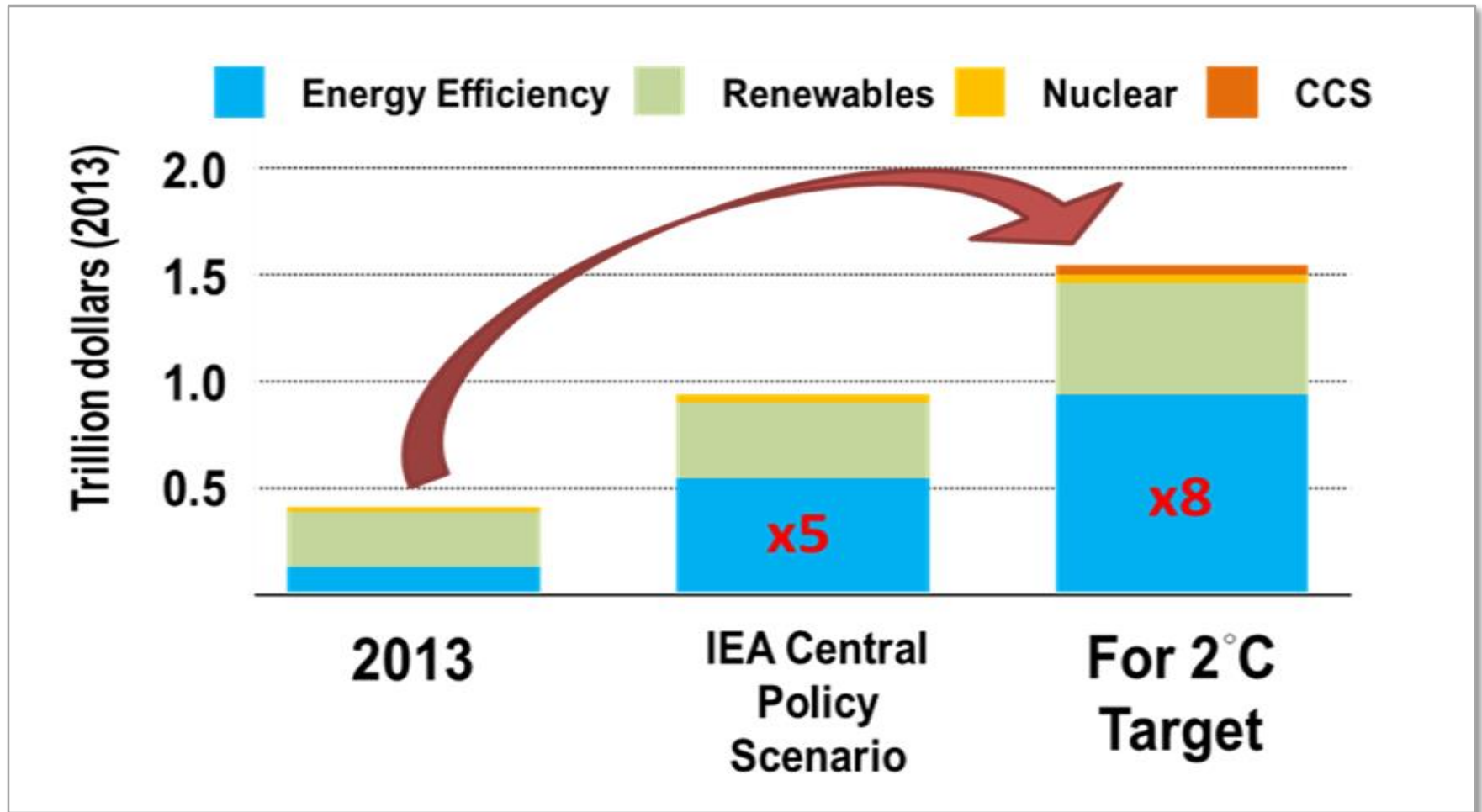


Note: These energy efficiency potentials are based on the IEA New Policies Scenario outlined in IEA (2012c).
Source: IEA (2012c), *World Energy Outlook 2012*, OECD/IEA, Paris.

Key point

IEA projections to 2035 show that as much as two-thirds of energy efficiency potential will remain untapped unless policies change.

Will we achieve it by 2030 ? Follow the money...



...which is why the EU set-up EEFIG...

18 months, 120 participants &
100 organizations

Energy Efficiency – the first fuel
for the EU Economy

How to drive new finance for energy
efficiency investments

FINAL REPORT

covering Buildings, Industry and SMEs

February 2015



Energy Efficiency
Financial Institutions Group

Key Headlines:

“High level support for the EEFIG’s work is in evidence in Europe and internationally.”

The Energy Collective, February 27th 2015

“The report is a milestone, representing one of the most potent collaborations to date between the European Commission and institutional investors on how regulation can feed directly into long-term, green financing: in this case, energy efficiency in property and SMEs.”

Responsible Investor, March 10th 2015

Key Supporting Quotes

“Energy efficiency is already the biggest source of “new” energy supply, but large untapped potential remains in Europe. Implementing the report’s recommendations can support economic growth and help tackle climate change at the same time.”

**Felipe Calderón, Former President of Mexico and Chair of
the Global Commission on the Economy and Climate**

“EU.BAC welcomes the new report of EEFIG that shows the importance for all stakeholders to find common solutions in order to accelerate energy efficiency financing.”

**Jean-Yves Blanc, President of
the European Building Automation and Controls Association**

EEFIG was asked “How to Increase the Flow of Energy Efficiency Investments in the EU” (x2 to x5)

EEFIG’s work has benefited from:

Active input of some 120 expert participants (8,000 hours)

40% of the EEFIG participants either work for, or represent the views of, financial institutions. Participation from financial institutions, policy makers, finance users (buildings, industry or SME) and energy efficiency experts

The Energy Efficiency Financial Institution Group (“EEFIG”) was established to determine how to overcome the well documented challenges to obtaining long-term financing for **energy efficiency**

EEFIG’s Mandate

1

What are the most imminent challenges that must be overcome?

2

Who would be the right party to address them?

3

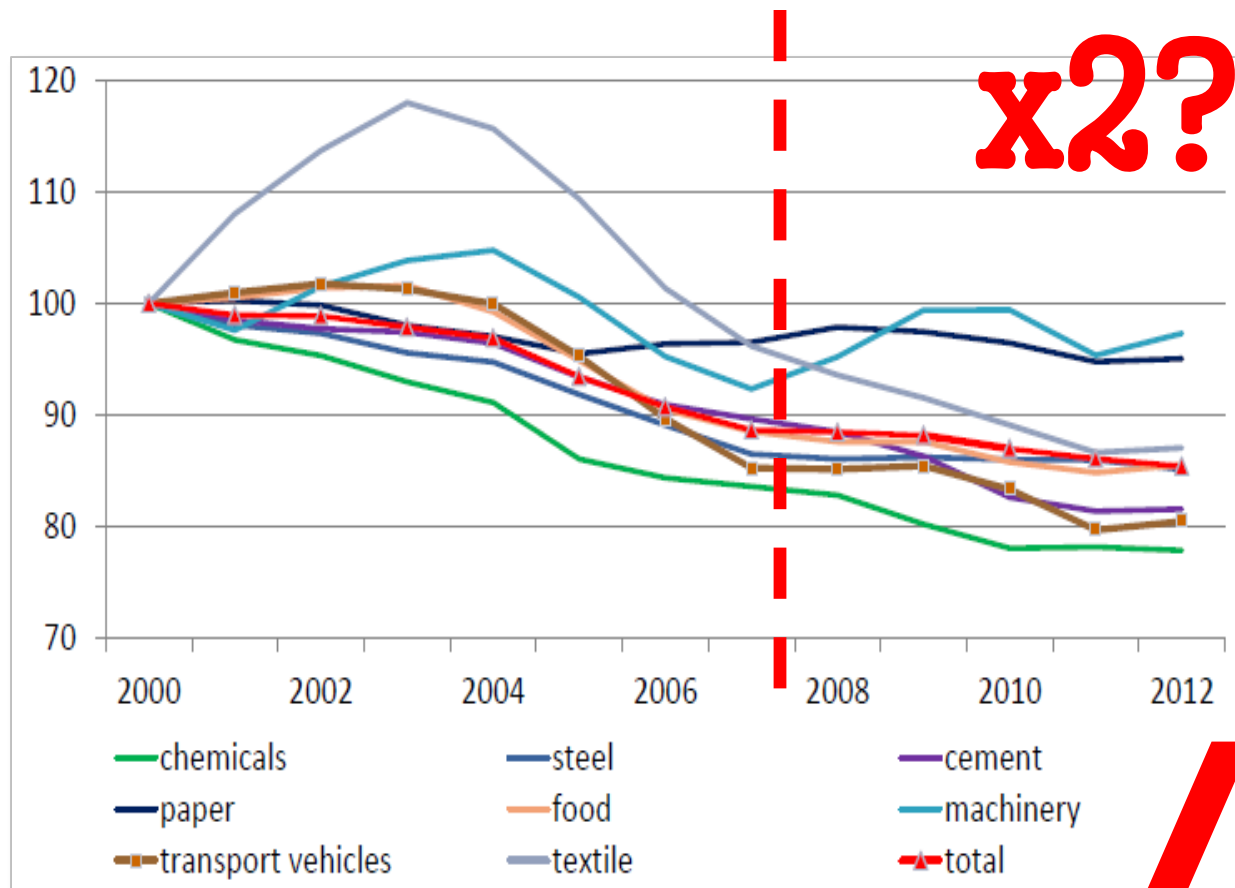
What should the European Commission/ EU do?

Example: EU Industrial Energy Efficiency: Just look out beyond 3 year paybacks!!

EU Industrial Energy Efficiency:

- Improved on average by 1.3% per annum over the last 15 years
- Speed of progress has been reduced since the financial crisis

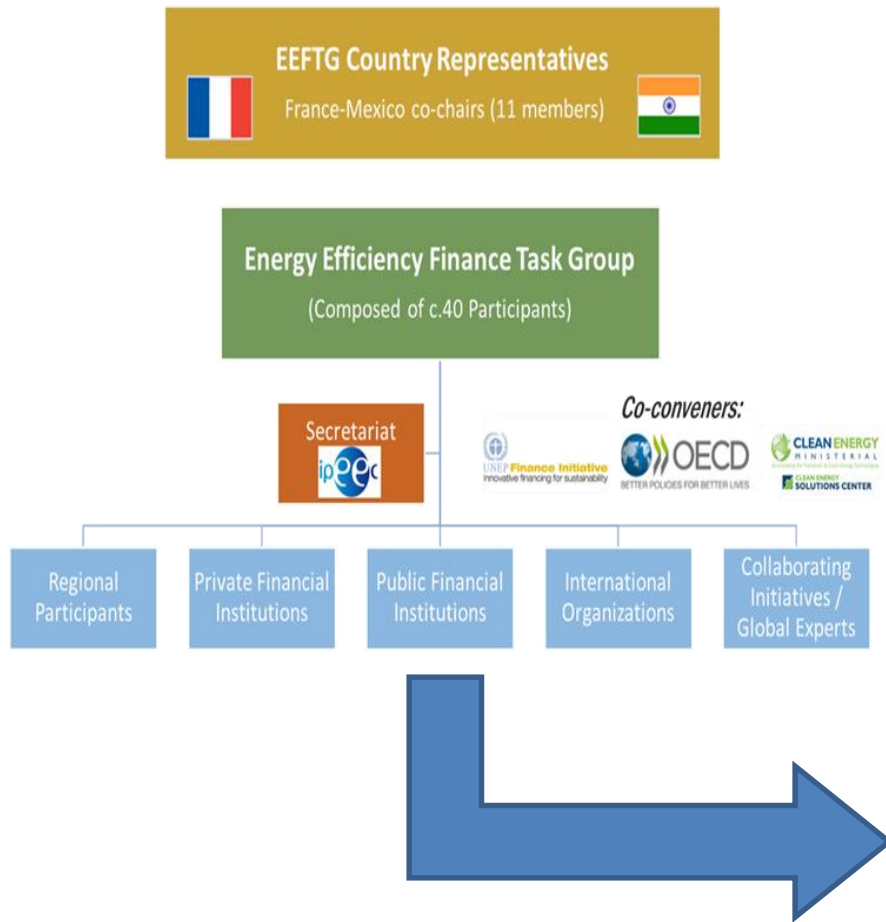
Yet Potential additional savings with a 2030-2050 horizon are substantial



Source: Energy Efficiency Index (ODEX) in EU Manufacturing Industries calculated by ODYSSEE-MURE project and published November 2014, using industry data rebased from year 2000.

We can, but **WILL** we deliver this opportunity by 2030 ?

Support the G20 Energy Efficiency Finance Task Group at 2pm !!



ipeec International Partnership for Energy Efficiency Cooperation

2015 Turkey G20

The IPEEC G20 Energy Efficiency Finance Task Group, co-chaired by France and Mexico, cordially invite you to contribute to their initiative in an expert policy and finance discussion on:

Enhancing capital flows to energy efficiency investments is a global challenge. What can be done to increase investments in energy efficiency for buildings and industry, and what forms of collaboration can best facilitate progress (drawing from US and European experience)?

The group will refer to the work of the Energy Efficiency Financial Institutions Group in the context of EEFTG (see <http://ipeec.org/EEFTG>)

EEFIG was established by the European Commission and UNEP Finance Initiative (UNEP FI) and launched its final report in February 2015. The report identifies the critical success factors, policies, and financing solutions necessary to increase energy efficiency investments in Europe.

May 13th, 2015
2PM - 4PM
 at the Energy Efficiency Global Forum*
 Walther E. Washington Convention Centre
 801 Mount Vernon Place, NW . Washington, D.C. 20001-3614

Please join other policy experts in energy efficiency finance from North America as they share their insights and contribute to the work of the G20 Energy Efficiency Task Group in supporting growth of energy efficiency investments globally.

This event is co-convened by:

CLEAN ENERGY MINISTERIAL SOLUTIONS CENTER
GRESB
OECD
UNEP FINANCE INITIATIVE

eeGLOBAL
 2015 ENERGY EFFICIENCY GLOBAL FORUM
 MAY 12-13 in WASHINGTON D.C.



KATERI CALLAHAN

President

Alliance to Save Energy

@KateriCallahan @ToSaveEnergy

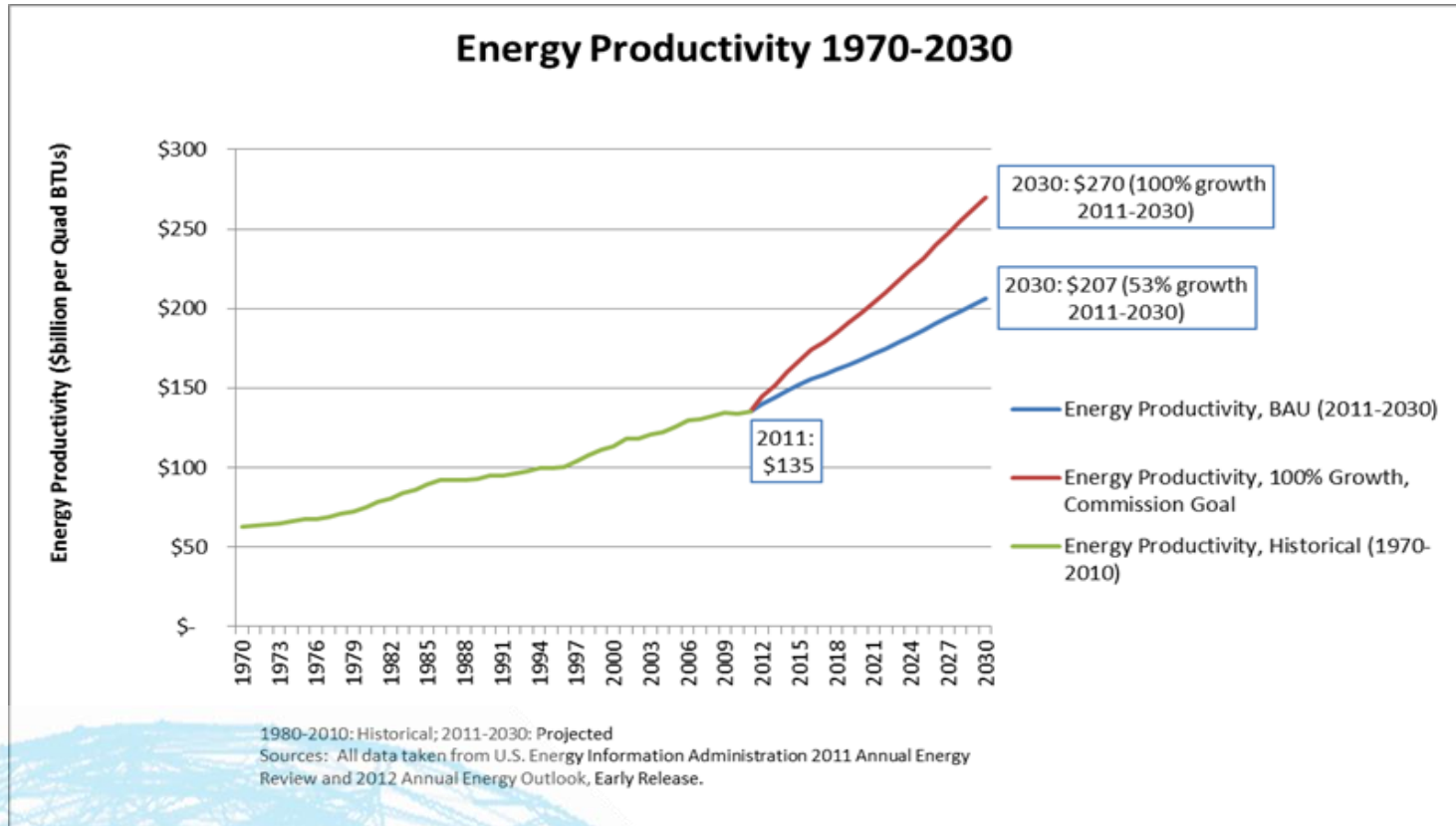




Using less. Doing more.

Accelerating Energy Productivity: Is Doubling Energy Productivity By 2030 An Achievable Goal?

Setting an Audacious but Doable Goal



Accelerate Energy Productivity 2030



2X **\$327**

ECONOMIC OUTPUT

Getting twice as much economic output from each unit of energy⁽¹⁾

BILLION

Saved annually in avoided energy costs⁽¹⁾

1.3

MILLION

Jobs created⁽¹⁾



IMPORTS

Reduced to represent a mere portion of overall energy consumption⁽¹⁾



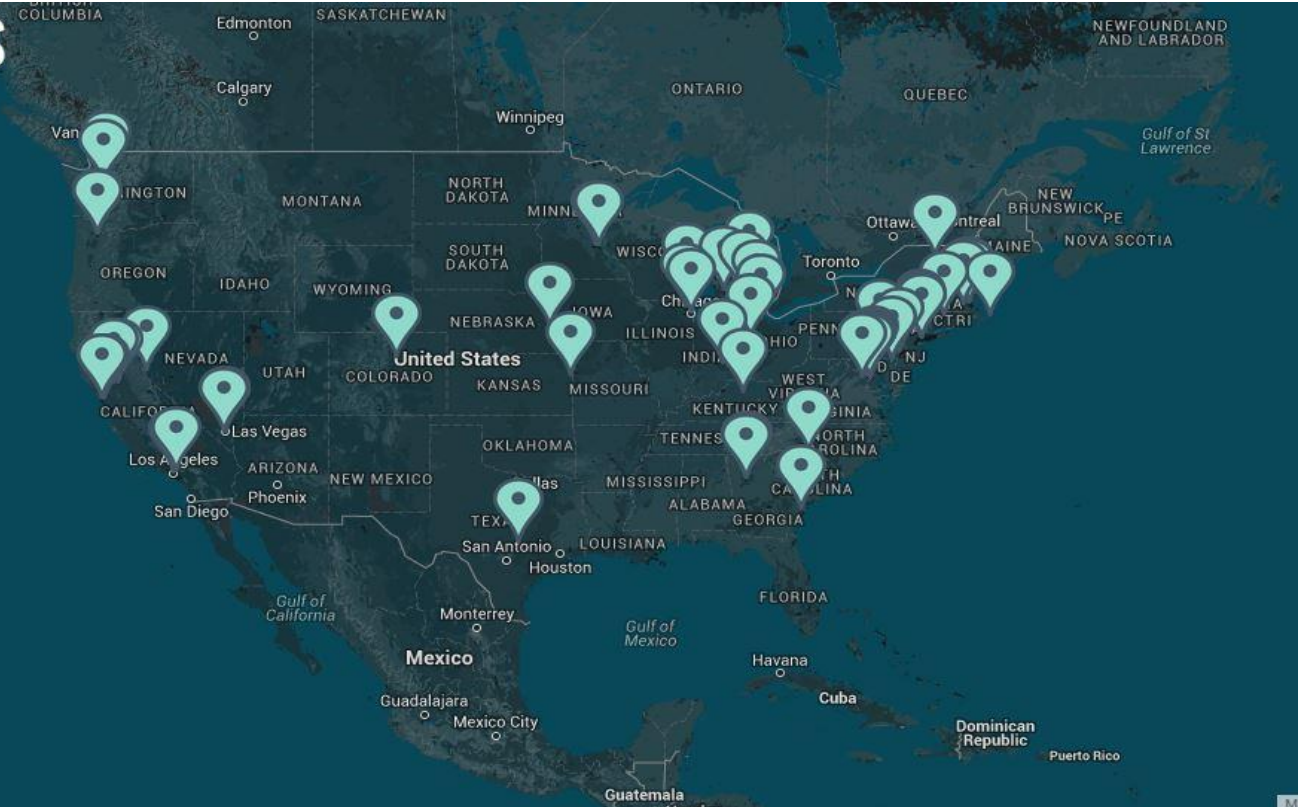
ACCELERATE ENERGY PRODUCTIVITY 2030

ENDORSE THE GOAL ENERGY2030.ORG



Using less. Doing more.

THE ENDORSERS



Endorsers include organizations such as:



The roadmap to achieve the Goal

Three Key Strategies

INVEST



MODERNIZE



EDUCATE



Using less. Doing more.

Announcing the Global Alliance for Energy Productivity

Working with government and corporate leaders to
double global energy productivity by 2030.



GLOBAL ALLIANCE
FOR ENERGY PRODUCTIVITY



 **ALLIANCE**
TO SAVE ENERGY

Using less. Doing more.

Global Alliance Secretariat



Using less. Doing more.

Steering Committee

Kandeh Yumkella (Chair)

Sustainable Energy for All

Martin Bornholdt

DENEFF

Kateri Callahan

Alliance to Save Energy

Odón de Buen

CONUEE, Mexico

Sanjay Dube

IIEC

Mark Kenber

The Climate Group

Patty Fong

European Climate Foundation

Dan Hamza-Goodacre

ClimateWorks Foundation

Jonathan Jutsen

Australian Alliance to Save Energy

Benoit Lebot

IPEEC

Ajay Mathur

Bureau of Energy Efficiency India

Krishnan Pallassana

The Climate Group

He Ping

Energy Foundation China

Harry Verhaar

Philips Lighting, EU-ASE



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Join us. Take the pledge!

Visit our website to endorse the goal:

www.globalproductivity.org

Take the next step and become a partner. Contact us at:

globalalliance@ase.org



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FOR ENERGY PRODUCTIVITY

 **ALLIANCE**
TO SAVE ENERGY

Using less. Doing more.



KANDEH YUMKELLA

*Special Representative of the Secretary-General & CEO
Sustainable Energy for All (SE4ALL)*

@KYumkella @SE4ALL





ANDREAS SCHIERENBECK

CEO & Executive Chairman

ThyssenKrupp Elevator AG

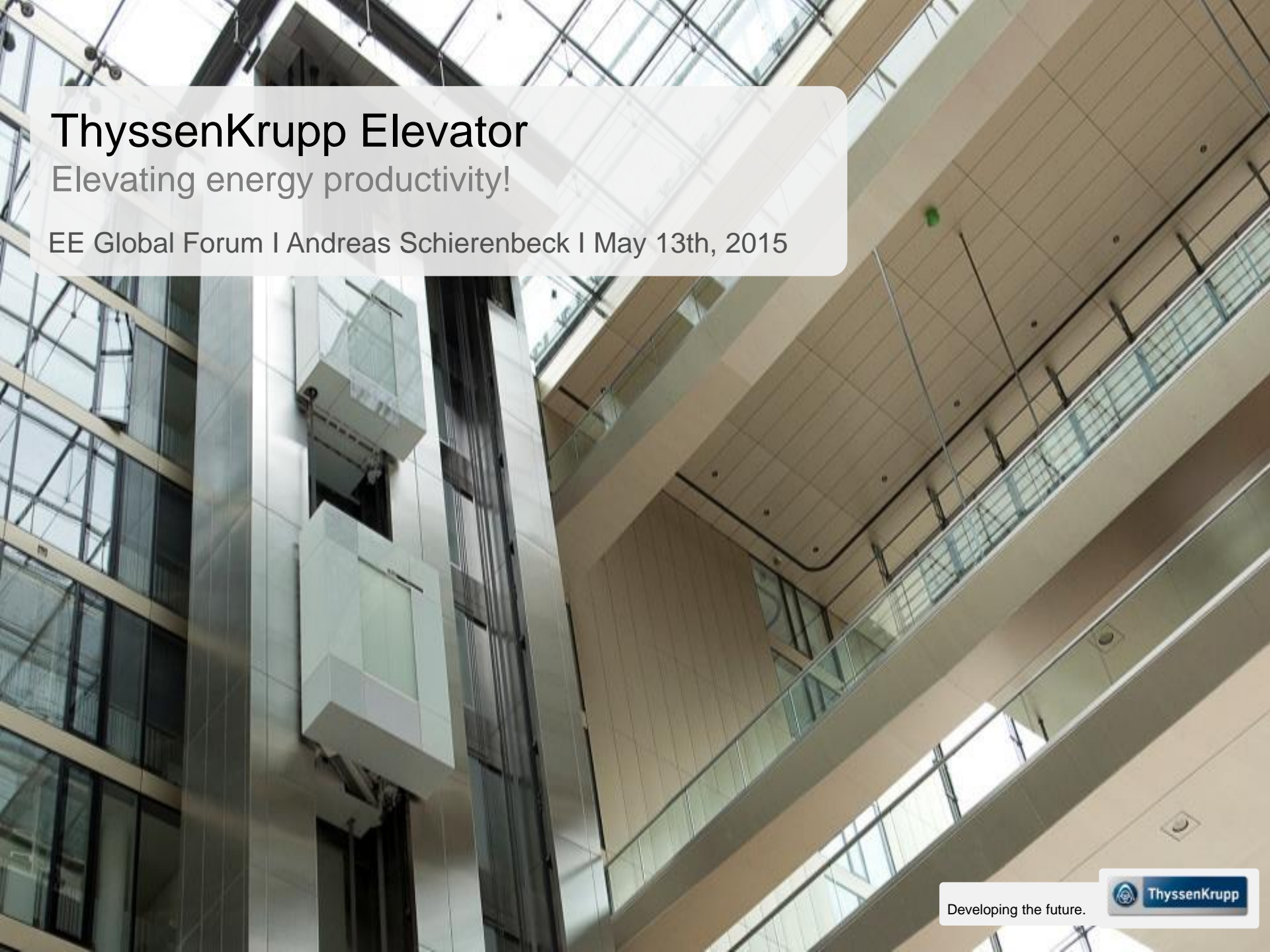
@TKE_Americas @thyssenkrupp_en



ThyssenKrupp Elevator

Elevating energy productivity!

EE Global Forum | Andreas Schierenbeck | May 13th, 2015

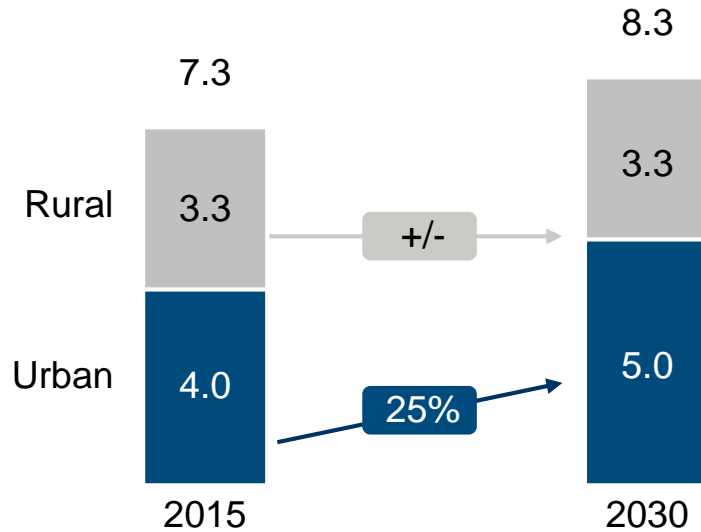


Developing the future.



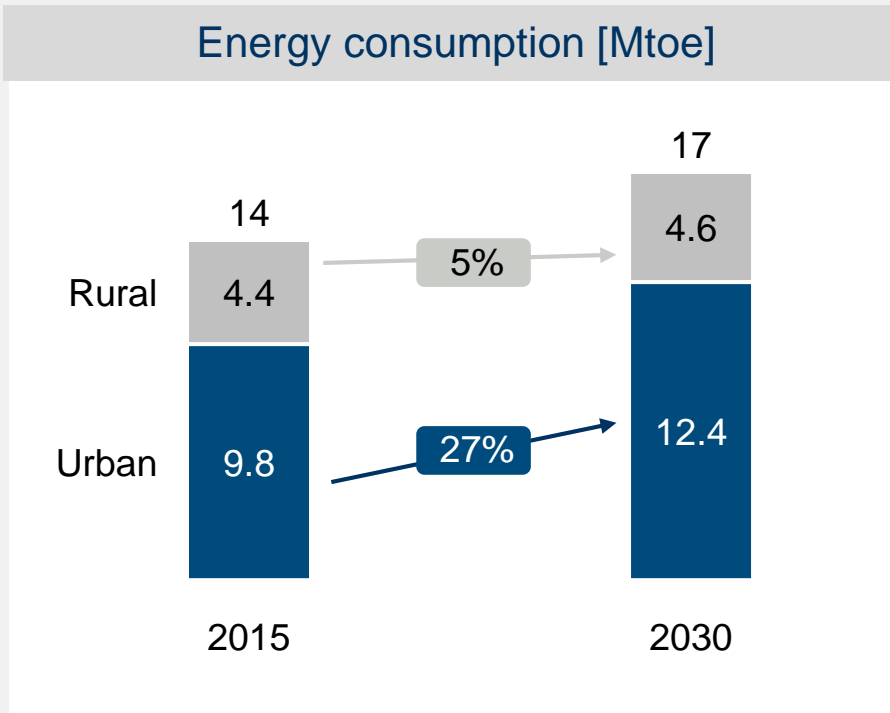
21st century: the first metropolitan century

Development of population [bn people]



By 2030 urban populations will account for 60%

Cities are the core of future energy landscape



By 2030 urban energy consumption will grow by 27%

Efficient urban planning is essential

Lower population density



Higher population density



Energy productivity [Btu/USD]

10

+20%

12

CO₂ [Gt]

10

-40%

6

GDP [bn USD]

64

+22%

78

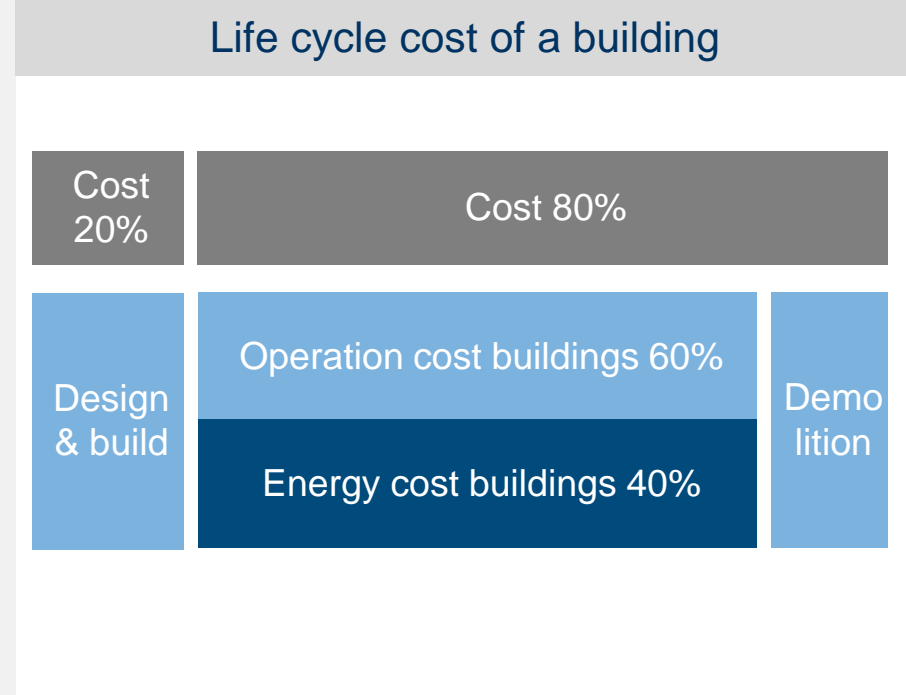
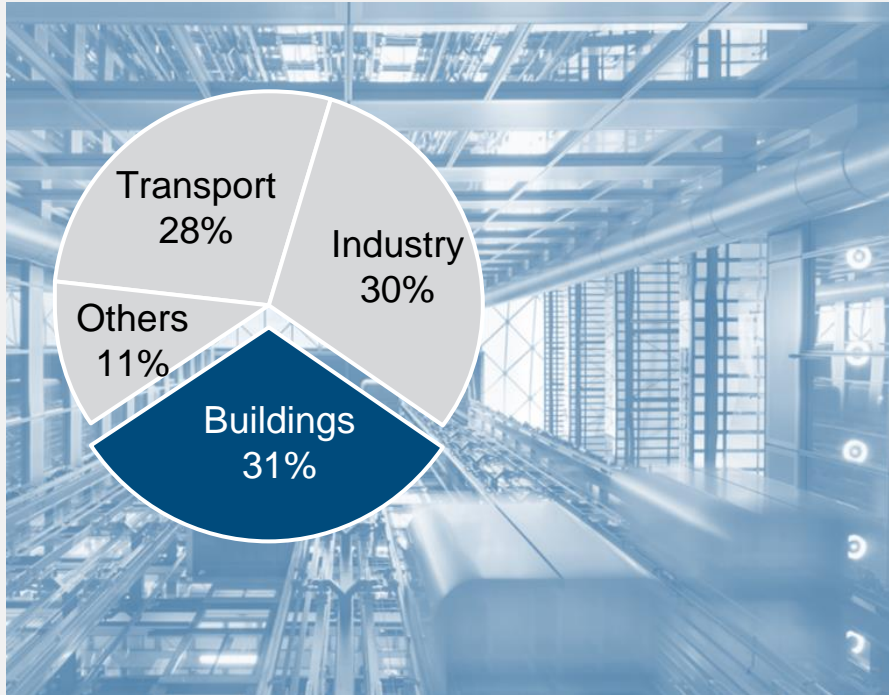
Investment [bn USD]

9.4

-34%

6.2

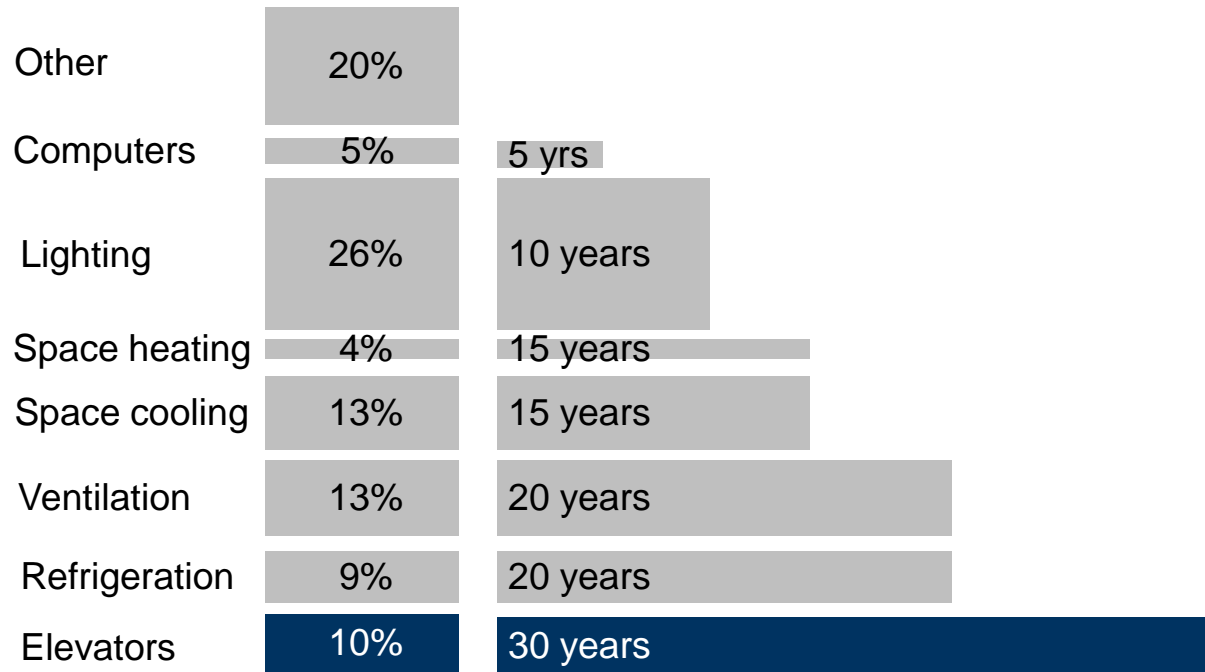
By 2030 buildings will consume 31% of all energy world wide



Elevators consume up to 10% of the total building energy

50% of a buildings electricity consumption locked in for ~15 years

Share of electricity consumption & equipment life expectancy

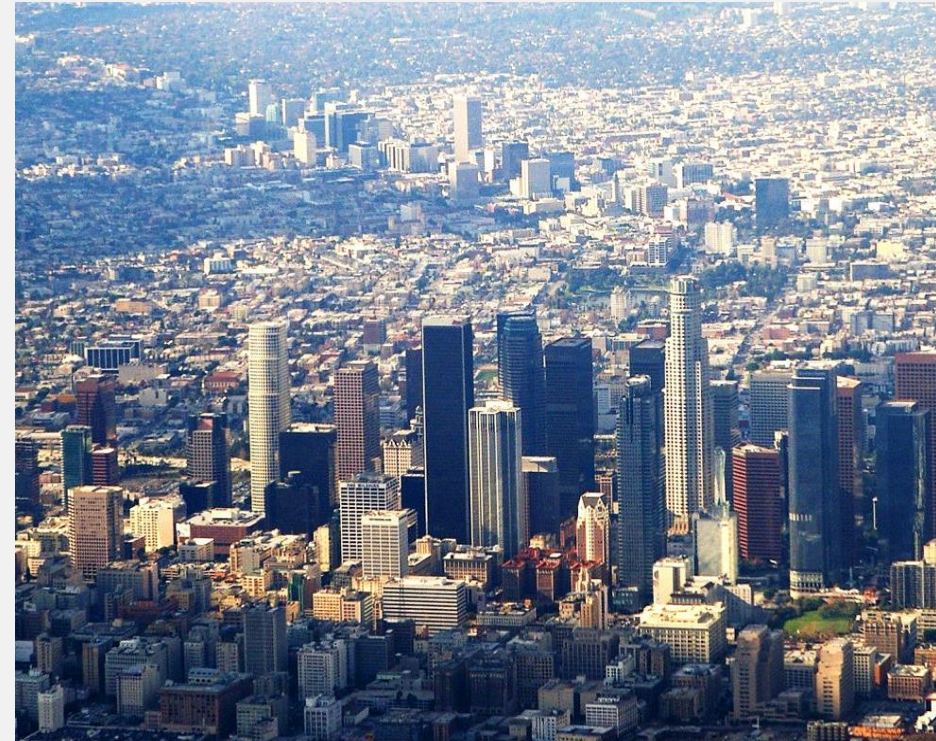


What could you do with the locked in energy?



+150.000 new buildings p.a.

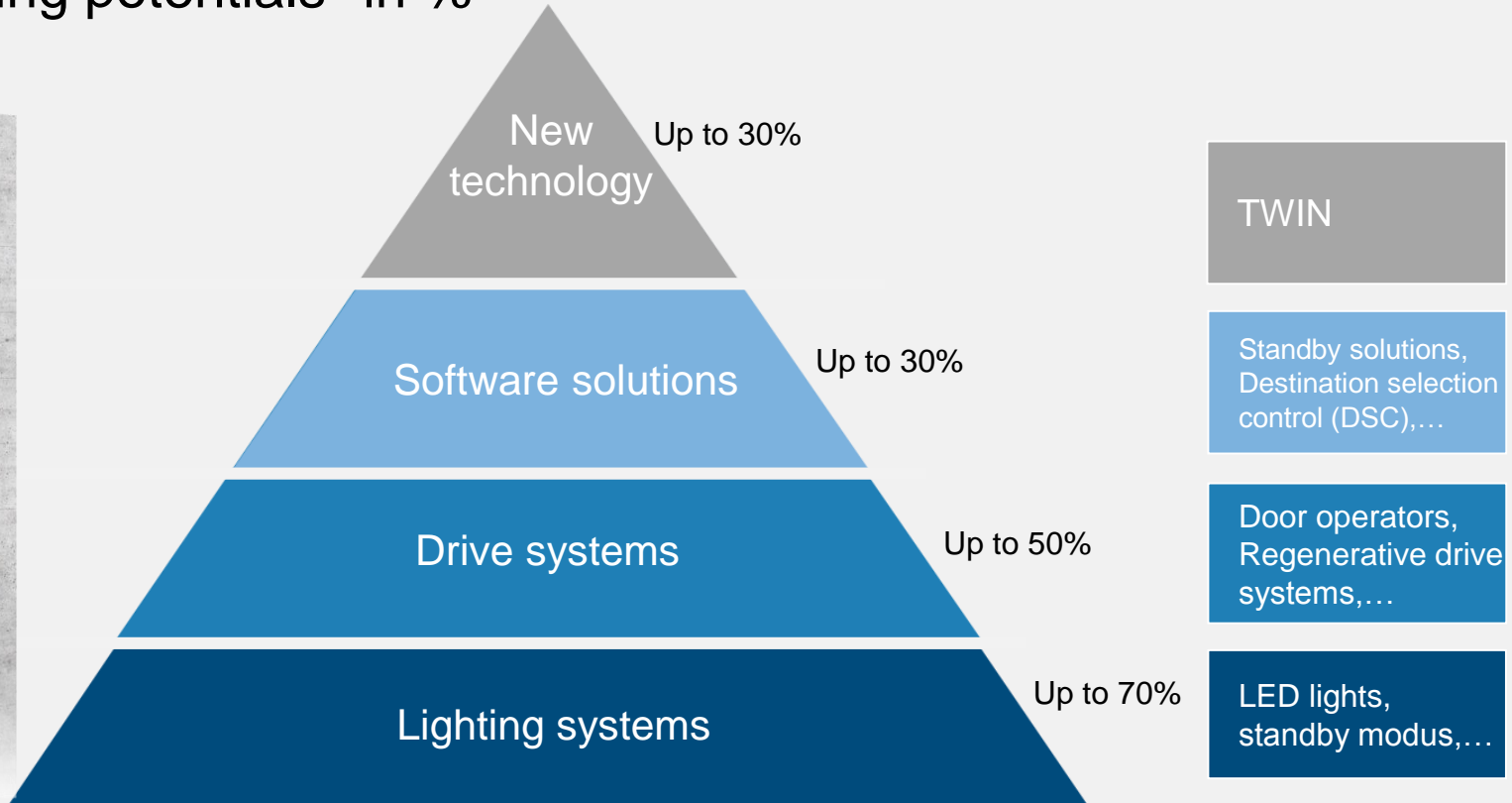
Locked in energy: ~120 TWh/a



~2 x Los Angeles County (~60 TWh/a)

Energy efficient solutions for elevators

Energy saving potentials* in %

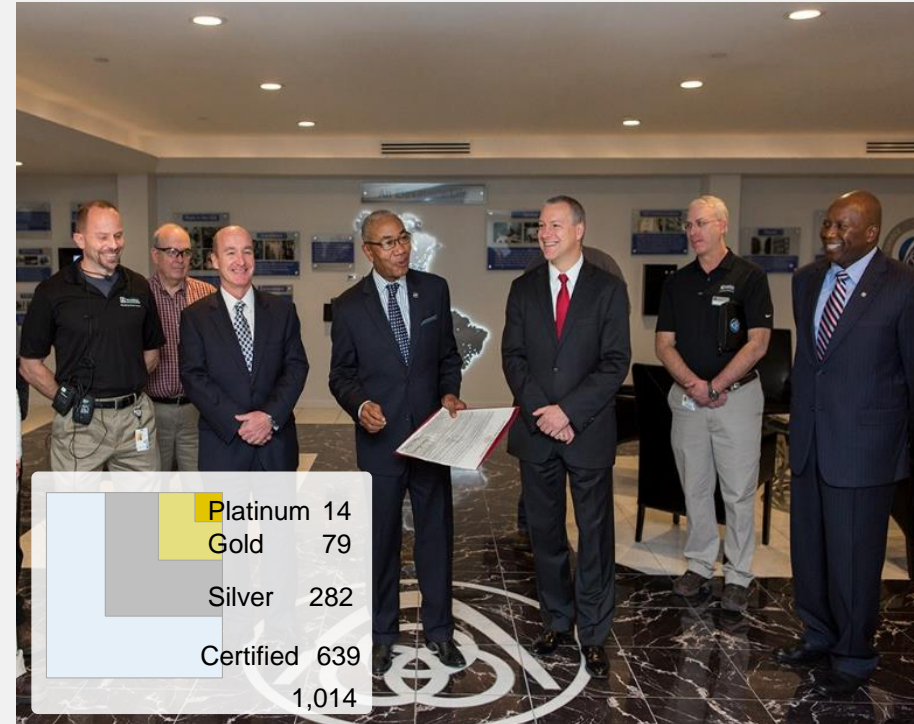
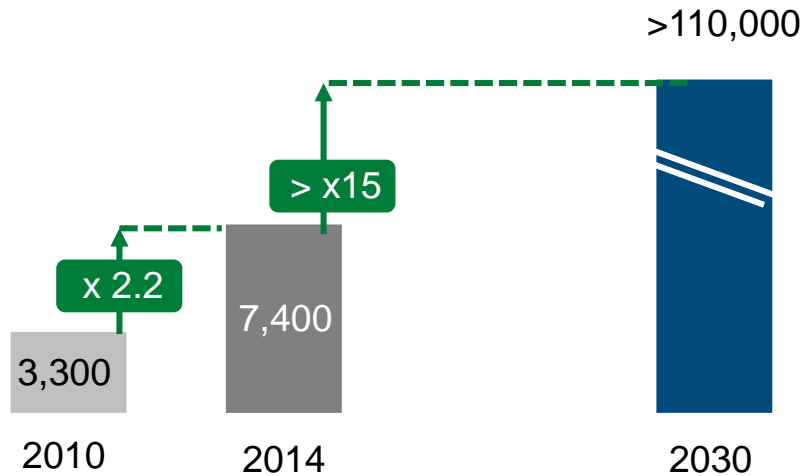


*) Energy savings compared to standard elevator systems

LEED certification is key



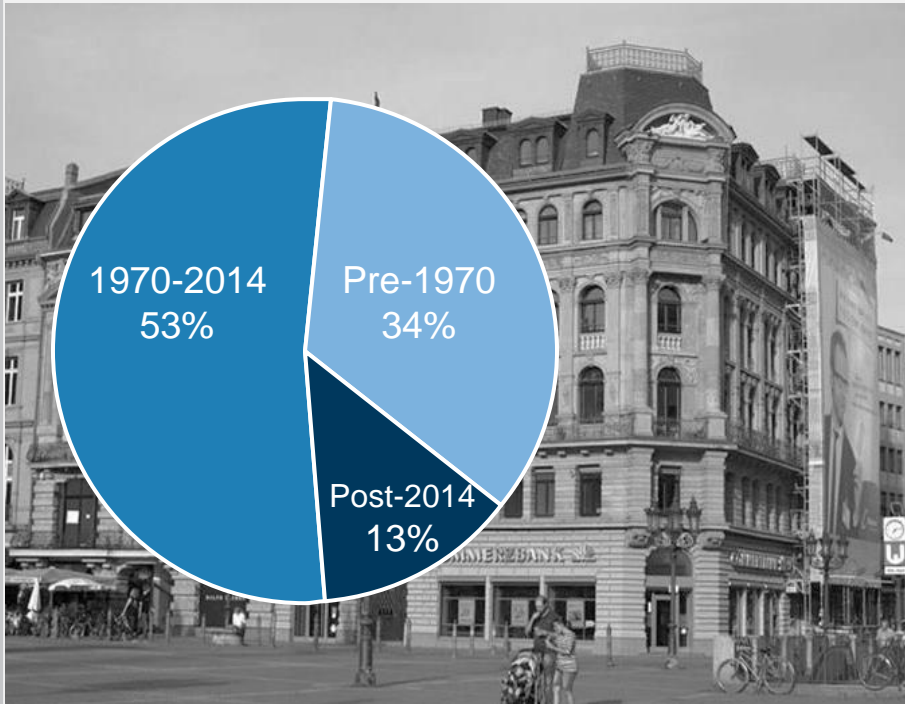
LEED certified projects in the US



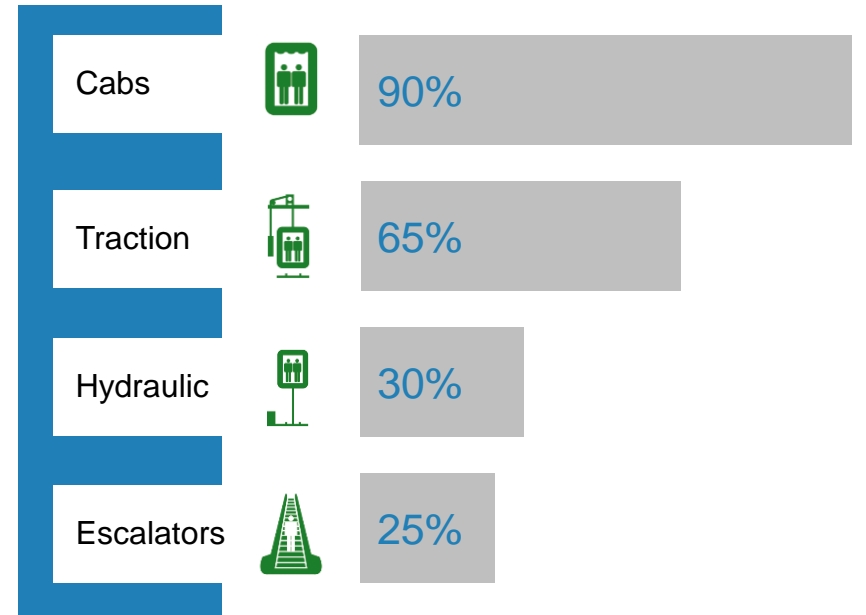
Platinum	14
Gold	79
Silver	282
Certified	639
Total	1,014

ThyssenKrupp products already in >1,000 LEED certified buildings

Modernization is key



Modernization potential

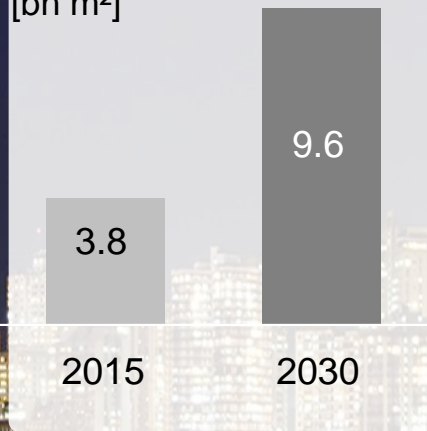


Third of building stock in 2030 will still be pre-1970s

Advanced technology for new constructions



Projected built space area
[bn m²]



Advanced technologies



- Reduce empty trips
- Provide up to 50% increased capacity



- Use 27% less power consumption
- Cut electrical loads by half
- Enable up to 30% reduced space

60% of 2030's floor space yet to be built

Doubling energy efficiency until 2030 – an achievable goal?



Key areas for immediate actions



Efficient urban planning



Use advanced technology



Take regional differences into account

~5 million existing buildings
~1 million running elevators
+19.000 new elevators p.a.

~50% older than 20 years
~3,300 GWh/a energy consumption
(equals a city with 600.000 inhabitants)

ThyssenKrupp Elevator

Elevating energy productivity!

EE Global Forum | Andreas Schierenbeck | May 13th, 2015

Developing the future.



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2015 ENERGY EFFICIENCY GLOBAL FORUM

KEVIN KOLEVAR

Vice President of Government Affairs & Public Policy

The Dow Chemical Company

@DowChemical



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JON JUTSEN

Chairman

Australian Alliance to Save Energy

@AA2SaveEnergy





HARRY VERHAAR

Chair

European Alliance to Save Energy

@Harry_Verhaar @PhilipsLight





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SAVE ENERGY

Creating an Energy-Efficient Europe

THE 2015 ENERGY PRODUCTIVITY AND ECONOMIC PROSPERITY INDEX

Harry Verhaar, Chairman European Alliance to Save Energy
EE Global, 12 May 2015, Washington D.C.



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PHILIPS

KNAUFINSULATION
it's time to save energy

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Electric

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Kingspan

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Climate Foundation


Kyoto Club

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Anni Podimata, MEP
(Greece, S&D)

Kathleen Van Brempt, MEP
(Belgium, S&D)

ENERGY PRODUCTIVITY

DOUBLING THE RATE OF ENERGY PRODUCTIVITY IMPROVEMENT



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Creating an Energy-Efficient Europe

THE 2015 ENERGY PRODUCTIVITY AND ECONOMIC PROSPERITY INDEX

How Efficiency Will Drive Growth,
Create Jobs and Spread Wellbeing
Throughout Society

By Kornelis Blok, Paul Hofheinz and John Kerkhoven



ECOFYS

the **Lisbon** council
think tank for the 21st century

QUINTEL
CONSULTING

EU Impact

Scenario: doubling the rate of EP:

1. **Reduction of energy expenditure by one third**
2. **Improved security of energy supply**
3. **Job creation 1.2 million* by 2020 (renovation; innovation)**

* Global: 6 million jobs



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Creating an Energy-Efficient Europe

Higher energy productivity facilitated 18% higher economic growth in the world's six largest economies

**Table 3: Additional GDP Facilitated through increased energy productivity
 (The big six, OECD and the world)**

In 2012 euros

Rank	Country or Area	Percent of GDP gained from higher energy productivity growth	Annual Energy Consumption (in exajoules)		Energy Productivity (in billions of euros per exajoule of energy consumed)		Change	GDP (in billions of euros)
			2011	2001	2011	2001		
1	Russian Federation	29%	28	25	92	65	739	2555
2	India	23%	30	18	159	123	1079	4722
3	EU 27	17%	65	68	206	171	2287	13381
4	United States	16%	86	87	143	119	2028	12301
5	Japan	16%	18	20	196	164	555	3473
6	China	16%	109	48	98	82	1700	10687
	OECD	15%	207	205	171	145	5379	35393
	World	12%	515	399	143	125	9008	73416

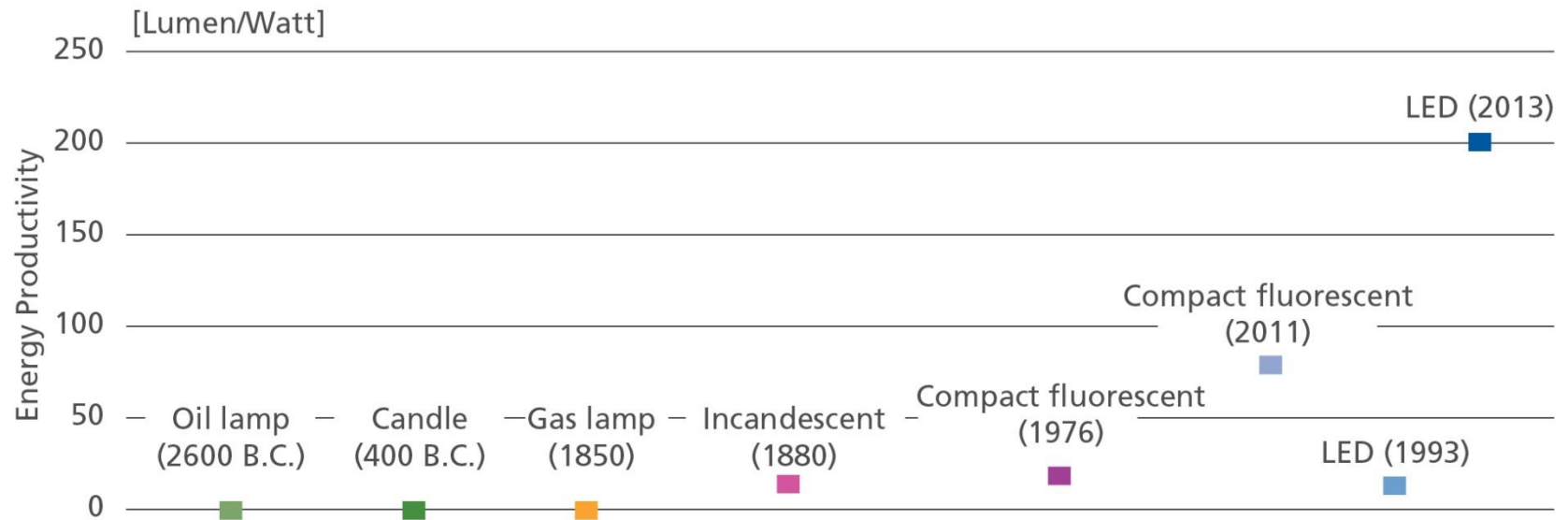
Sources: Worldbank, International Energy Agency, Ecofys analysis



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Creating an Energy-Efficient Europe

Lighting energy productivity



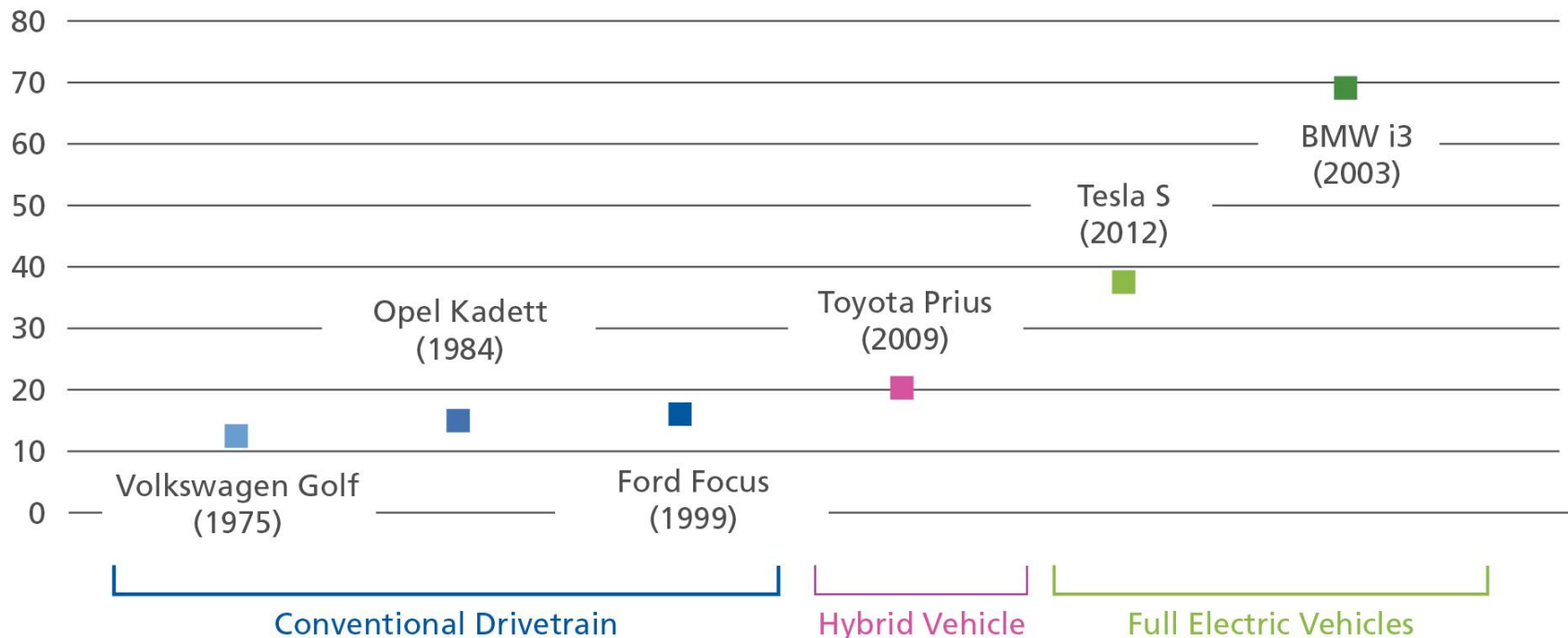


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Passenger cars energy productivity

kilometers / liter gasoline



Improvement in fuel productivity of different car types. Electricity consumption by electric vehicles is converted to gasoline equivalents (final energy consumption) (Automobile-catalog, 2014) (US DOE, 2014) (BMW, 2014)

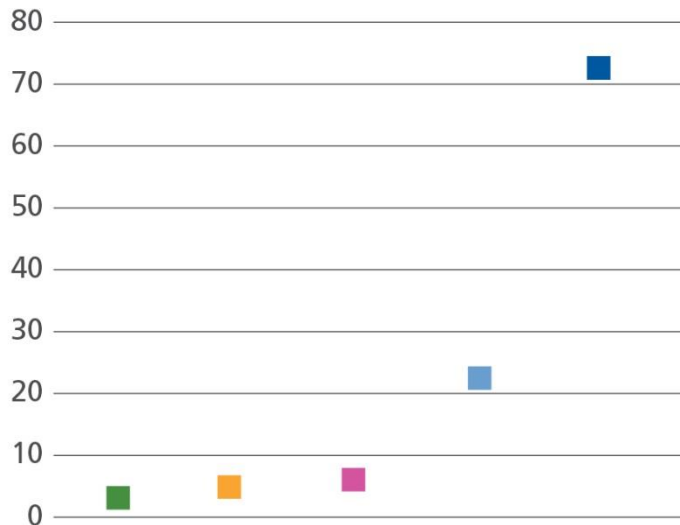


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Household energy productivity

Square metres heated with 1000 kWh

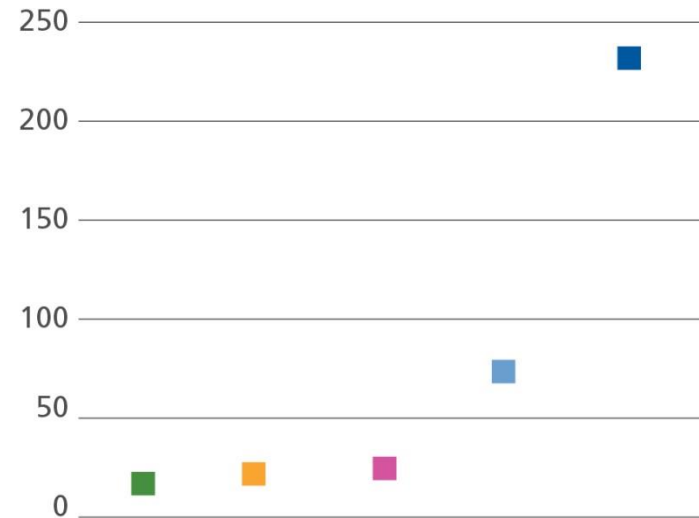


Adopted from Schleyer-Kohler (2006) and IWU (2011)
The development of the energy productivity of new buildings in Germany in terms of m² heated/MWh and days heated/MWh

- No insulation
- First German building code (1977)
- German building code anno 1995
- Current German building code (2012)
- Near zero energy house

Household energy productivity

Number of days a house can be heated with 1000 kWh



Adopted from Schleyer-Kohler (2006) and IWU (2011)

Hong Kong leads the global energy productivity ranking, its economy is mostly services



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Table 1: The Energy Productivity Index (Top 50)

in billions of euros of GDP per exojoule of energy consumed

Rank	Country	Productivity	Rank	Country	Productivity
1	Hong Kong SAR, China	456	27	France	186
2	Colombia	330	28	Saudi Arabia	181
3	Singapore	329	29	Pakistan	174
4	Switzerland	310	30	Malaysia	172
5	Peru	287		<i>OECD members</i>	171
6	Philippines	256	31	Poland	165
7	Italy	246	32	Thailand	163
8	Portugal	242	33	Belgium	162
9	Spain	236	34	India	159
10	Turkey	234	35	Sweden	158
11	United Kingdom	231	36	Australia	150
12	Bangladesh	228	37	United Arab Emirates	148
13	Algeria	225	38	United States	143
14	Egypt, Arab Rep.	224		<i>World</i>	143
15	Norway	224	39	Nigeria	138
16	Greece	220	40	Venezuela, RB	137
17	Germany	220	41	Vietnam	135
18	Austria	217	42	Korea, Rep.	134
19	Netherlands	215	43	Czech Republic	131
20	Brazil	210	44	Canada	118
21	Iraq	207	45	Iran, Islamic Rep.	117
	<i>European Union</i>	206	46	China	98
22	Mexico	201	47	Russian Federation	92
23	Chile	201	48	South Africa	85
24	Japan	196	49	Kazakhstan	85
25	Indonesia	195	50	Ukraine	60
26	Romania	192			

The 50 countries chosen are the world's 50 largest based on purchasing power parity adjusted GDP. The euros are taken at their 2012 rate, purchasing power parity adjusted.

Starting points matter: Catch-up countries are doing most to 'catch up'



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Table 2: Improvement in Energy Productivity Index (Top 50)

Underlying figures in billions of euros of GDP per exajoule of energy consumed (2001-2011)

Rank	Country	Growth per year	Rank	Country	Growth per year
1	Nigeria	6,45%	26	Greece	1,43%
2	Ukraine	4,87%	27	Spain	1,39%
3	Romania	4,31%	28	Korea, Rep.	1,38%
4	Singapore	4,29%		World	1,32%
5	Philippines	4,24%	29	France	1,31%
6	Hong Kong SAR, China	4,01%	30	South Africa	1,14%
7	Russian Federation	3,47%	31	Bangladesh	1,03%
8	United Kingdom	3,28%	32	Venezuela, RB	1,00%
9	Poland	3,06%	33	Portugal	0,96%
10	Czech Republic	3,00%	34	Saudi Arabia	0,94%
11	India	2,63%	35	Norway	0,80%
12	Sweden	2,59%	36	Iran, Islamic Rep.	0,74%
13	Indonesia	2,54%	37	Austria	0,69%
14	Germany	2,27%	38	Turkey	0,60%
15	Switzerland	2,26%	39	Italy	0,50%
16	Colombia	2,08%	40	Peru	0,49%
17	Canada	2,04%	41	Thailand	0,27%
	European Union	1,89%	42	Chile	0,15%
18	United States	1,82%	43	Brazil	0,14%
19	Japan	1,76%	44	Vietnam	-0,05%
20	China	1,75%	45	Iraq	-0,25%
	OECD members	1,66%	46	Egypt, Arab Rep.	-0,38%
21	Belgium	1,53%	47	Mexico	-0,39%
22	Australia	1,52%	48	Kazakhstan	-0,82%
23	Pakistan	1,51%	49	Algeria	-0,90%
24	Netherlands	1,47%	50	United Arab Emirates	-1,56%
25	Malaysia	1,46%			

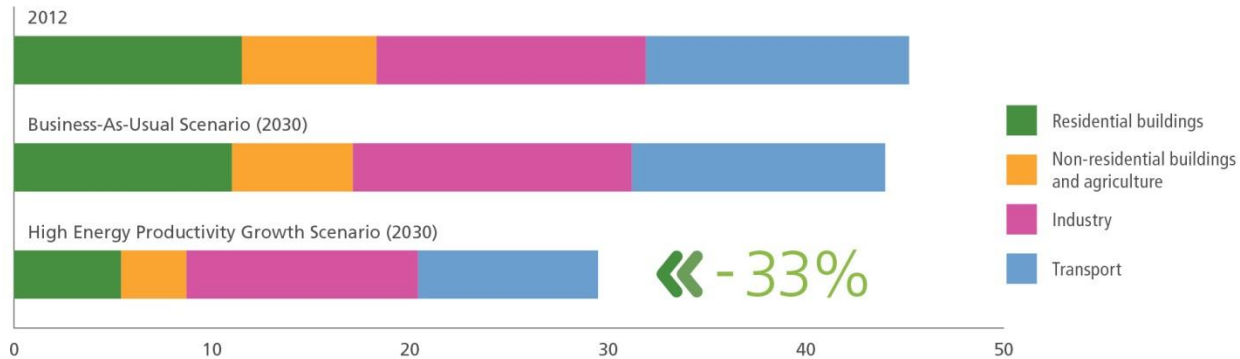


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European Union

Final energy consumption in the European Union in two scenarios (in exajoules)



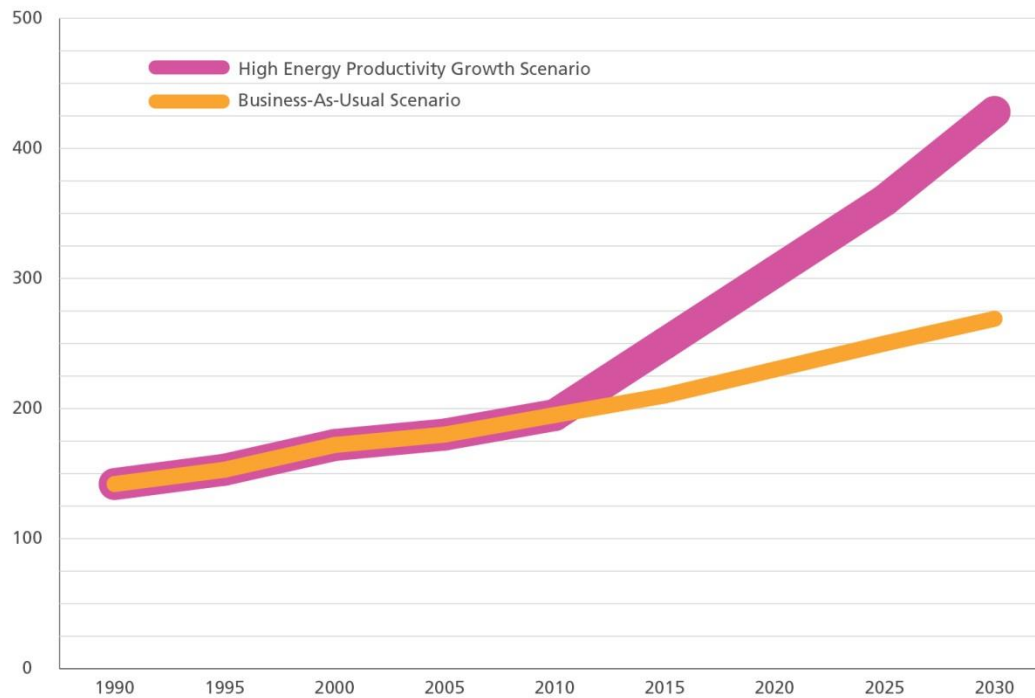


EUROPEAN ALLIANCE TO
SAVE ENERGY

Creating an Energy-Efficient Europe

European Union

The impact of energy productivity on GDP (in billions of euros per exajoule)





EUROPEAN ALLIANCE TO
SAVE ENERGY

Creating an Energy-Efficient Europe

MAIN CONCLUSIONS

1. 98% OF ALL ENERGY PRODUCED GLOBALLY IS WASTED THROUGH INEFFICIENCY
2. WE CAN DOUBLE THE RATE OF ENERGY PRODUCTIVITY WITH EXISTING EE TECHNOLOGY
3. HOUSEHOLD ENERGY BILLS COULD BE CUT BY A THIRD BY 2030
4. DOUBLING THE RATE OF ENERGY PRODUCTIVITY IMPROVEMENT FROM CLOSE TO 1.5% TO 3%
PER YEAR COULD CREATE MORE THAN 6 MILLION JOBS ALREADY BY 2020
5. THE GLOBAL FOSSIL FUEL BILL COULD BE CUT BY MORE THAN €2TRILLION BY 2030



MICHAEL CARR

*Senior Advisor & Principal Deputy Assistant Secretary,
Office of Energy Efficiency and Renewable Energy*

Department of Energy

@ENERGY



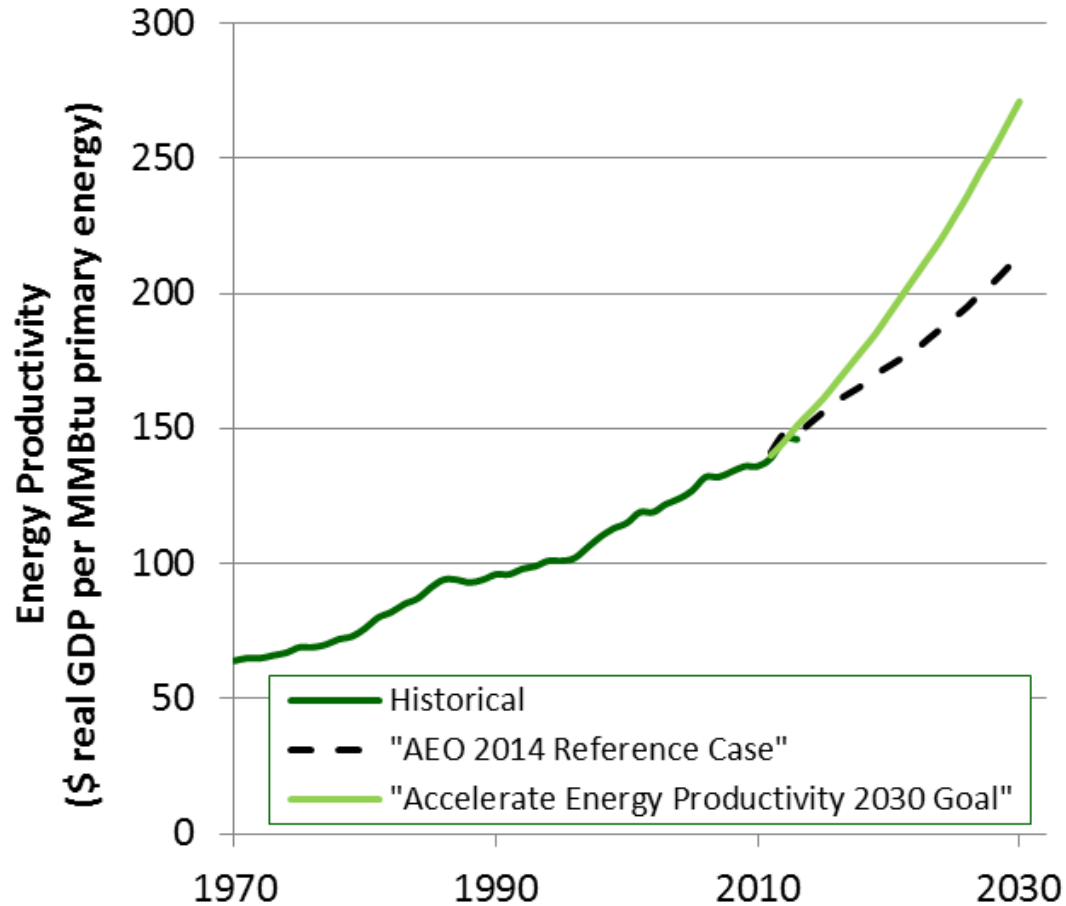
Office of Energy Efficiency and Renewable Energy



U.S. DEPARTMENT OF
ENERGY

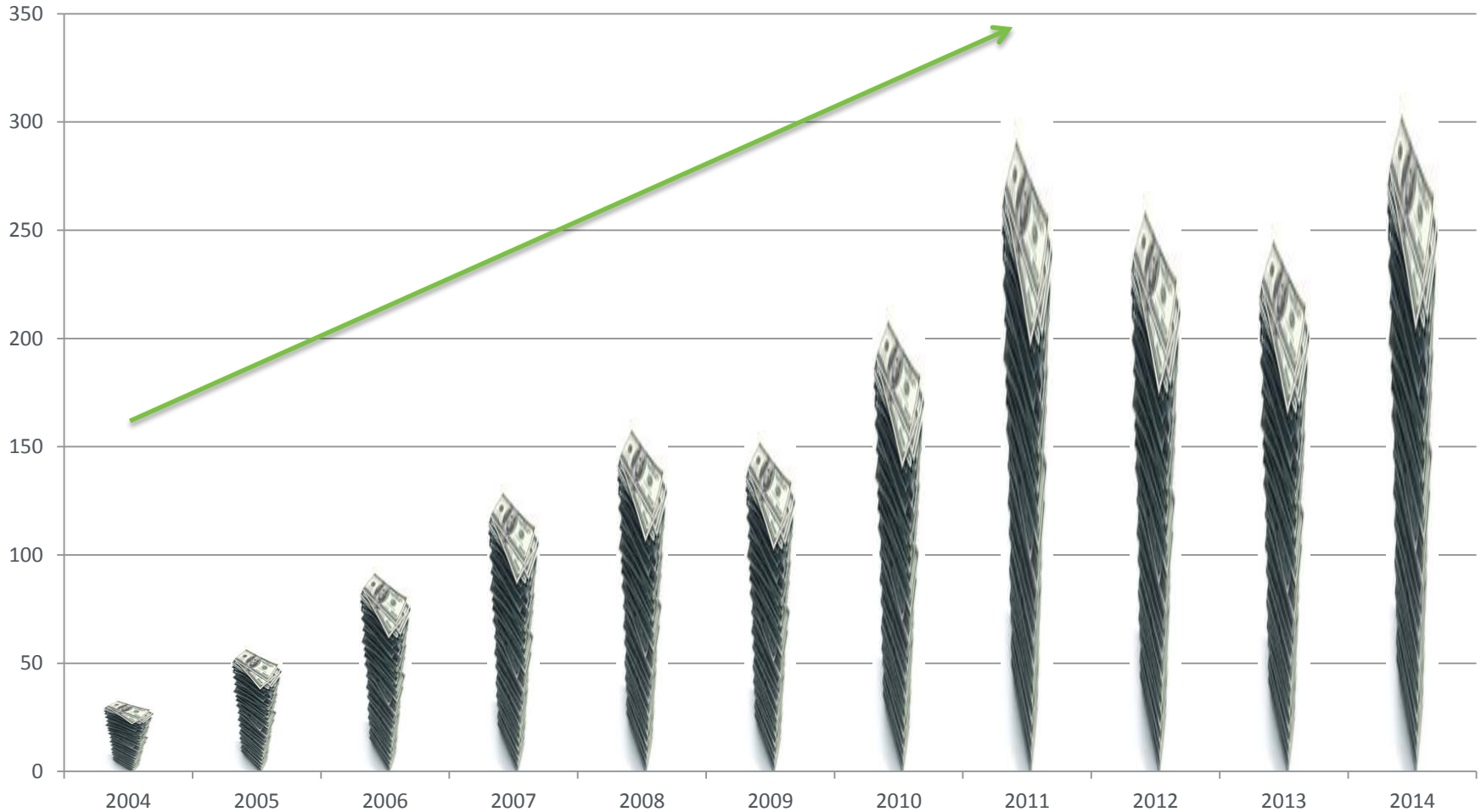
Energy Efficiency &
Renewable Energy

Energy Productivity



Why It Matters: Global Race

Global Clean Energy Investment, 2004-2014 (Billions of \$)



Source: Bloomberg New Energy Finance

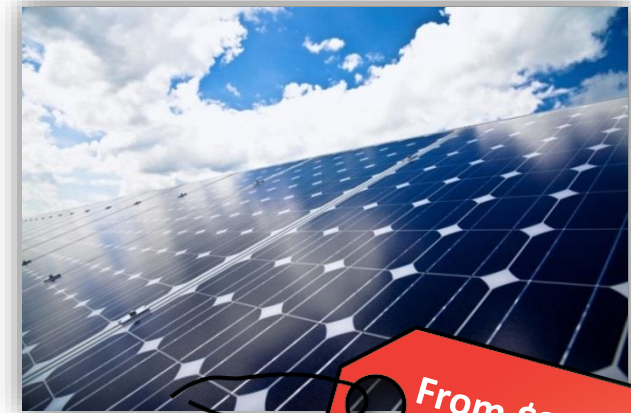
Administration and EERE Goals

	Clean Electricity	Transportation	Buildings/Industry	Federal Sustainability
	Reduce GHG emissions by 26-28% by 2025			
Administration	-By 2035, generate 80% of electricity from a diverse set of clean energy resources	-Reduce oil imports by 1/3 by 2025 -Put 1 million electric vehicles on the road by 2015	-Make non-residential buildings 20% more energy-efficient by 2020 -CHP: 40 new GW by 2020 -Weatherize 1 million homes by 2013	-Reduce Scope 1&2 GHG emissions by 28%; Scope 3 by 13% (2008 baseline) -26% improvement in water efficiency by 2020 -\$2B ESPCs by end of 2013
	SunShot Initiative: Subsidy-free solar energy cost-competitive at \$1/watt, or about \$0.06/kWh	Biomass – less than \$3/gallon for drop-in fuels such as renewable gasoline, diesel, and jet fuel	Improve building efficiency by 50% by 2030	
EERE	Wind: LCOE parity with Natural Gas (0.06/kWh), but full market cost competition without subsidization	Cars able to achieve fuel economy greater than 60mpg by 2025	For 2013, issue four Final Rules for Appliance Standards.	Support Federal agencies
	Water: Unsubsidized parity with Natural Gas; 30+ GW Water 2020, 123+GW Water 2030	Batteries – ½ today's price in 2015, ¼ today's price in 2020	Reduce industrial energy intensity by 25% over 10 years	DOE leadership
	Geothermal: Lower the EGS cost to \$0.09/kWh by 2020; \$0.06/kWh 2030	Fuel cells for vehicles \$30/kW; 5000h duration	Improve lifecycle efficiency of targeted products by 50%	

Industry Growth



+61 GW of wind capacity



From \$3.68 to \$1.68/W

+70% to goal of \$0.06 per kilowatt hour



54.5 mpg by 2025

+118k units sold in 2014 – 27% increase



As low as \$2/yr.

U.S. DEPARTMENT OF **ENERGY**

Energy Efficiency & Renewable Energy

Manufacturing Growth



- 700,000 manufacturing jobs added since 2009
- Creating new industries like additive manufacturing
- World's first 3D printed car printed in 44 hours!



Climate Action Plan

“We will respond to the threat of climate change knowing that the failure to do so would betray our children and future generations.”

- President Obama, Second Inaugural Address, January 2013



The Climate Action Plan has three pillars:

- 1) Mitigation: Cut Carbon Pollution in America
- 2) Adaptation: Prepare the U.S. for the Impacts of Climate Change
- 3) International Cooperation: Lead International Efforts to Address Global Climate Change

THANK YOU



SENATOR CHRIS COONS

(D-DE)

U.S. Senate

@ChrisCoons





MORNING PLENARY SESSION

Accelerating Energy Productivity: Is Doubling Energy Productivity by 2030 an Achievable Goal?

