U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON
2011

It all comes down to people -

The key to sustaining energy efficient behaviors

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Demand for energy is increasing…

… faster than new sources can be found,

David Dodge, Pembina Institute

… faster than new technologies can be developed.


Fossil fuels contribute to pollution, lung disorders and other illnesses.

Climate change is real and brings extreme weather.


80 countries suffer water shortages.

×2

Energy demand
By 2050

Electricity to double by 2030

Source: IEA

vs.

÷2

CO_2 emissions to avoid dramatic climate changes

(vs. 1990 level) Source: IPCC


The energy dilemma
Conserve resources and decrease emissions?
Use resources to grow our economies and improve quality of life?

We can’t wait for new technologies, and we don’t have to.

Energy efficiency solutions are available now.


Transportation is
often top of the
agenda,

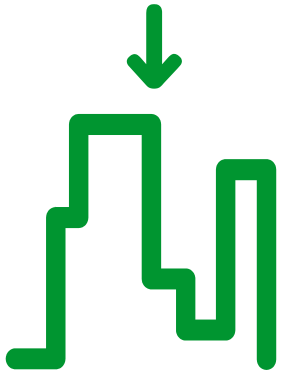
but industry and buildings consume nearly three times as much energy.

33%

Industry (incl Industrial building)

21%

Residential



18%

Tertiary Building

28%

Transportation

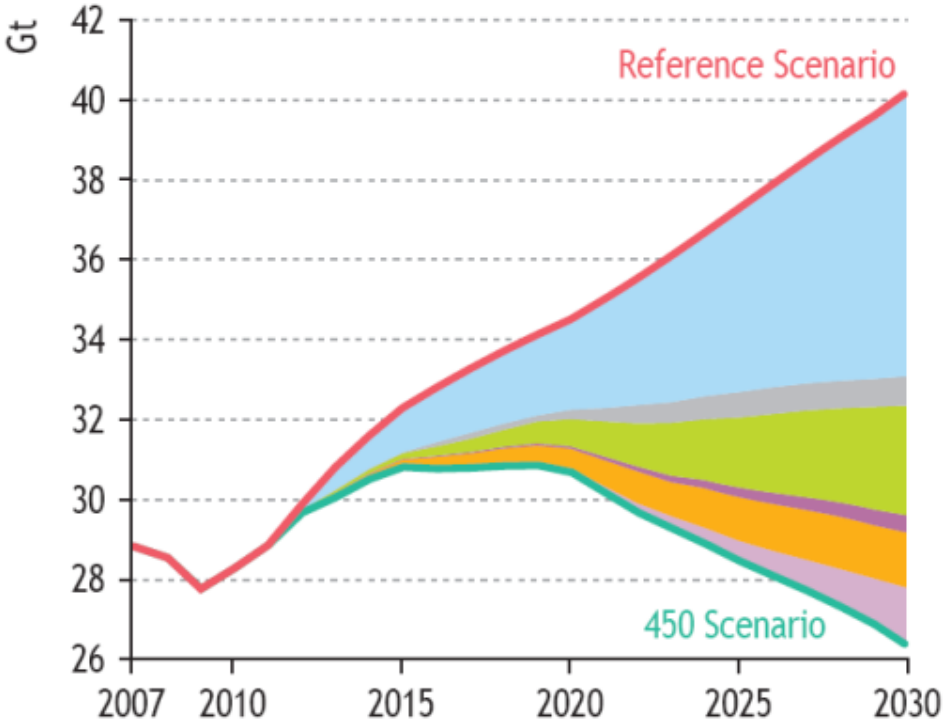
The solution is a combination of

cleaner generation and efficiency

INTERNATIONAL ENERGY AGENCY

- Over 50% of CO_2 emission abatement will be from end use efficiency

World energy-related CO_2 emissions abatement

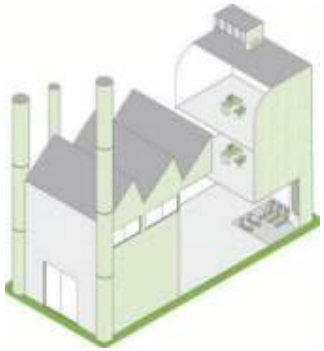


	Abatement (Mt CO_2)		Investment ($2008 billion)	
	2020	2030	2010-2020	2021-2030
Efficiency	2 517	7 880	1 999	5 586
End-use	2 284	7 145	1 933	5 551
Power plants	233	735	66	35
Renewables	680	2 741	527	2 260
Biofuels	57	429	27	378
Nuclear	493	1 380	125	491
CCS	102	1 410	56	646

Source: World Energy Outlook 2009, OECD / IEA

…as efficiency counts triple

Coal → 100 units → 35 units → 33 units



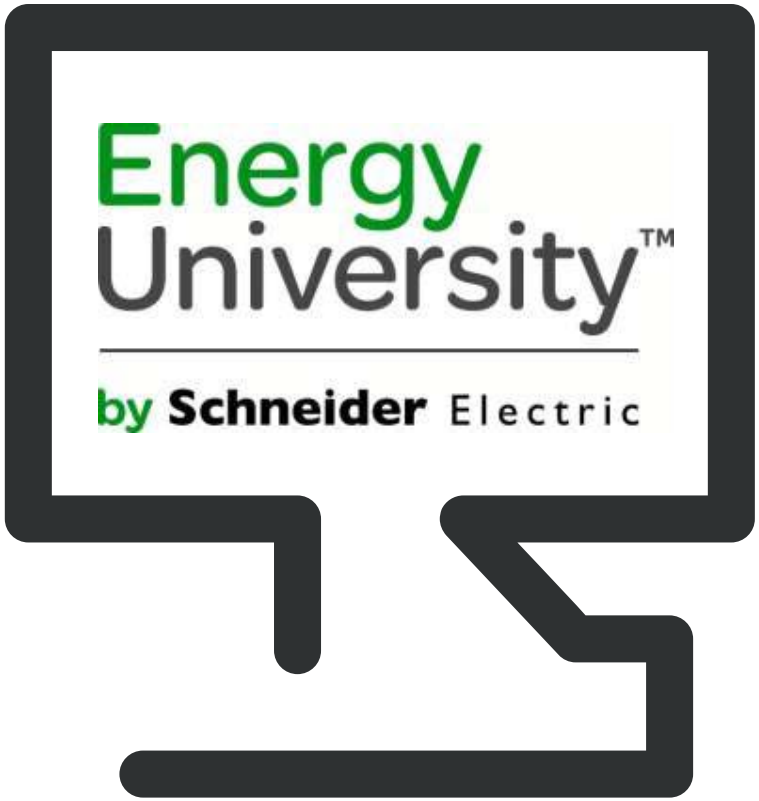
1 unit saved at point of use = **3 units of primary energy not consumed**

Energy isn't free…
but learning to save it is

Energy University is the most accessible and relevant education resource for energy professionals

Energy University™
by Schneider Electric

The classroom is your computer

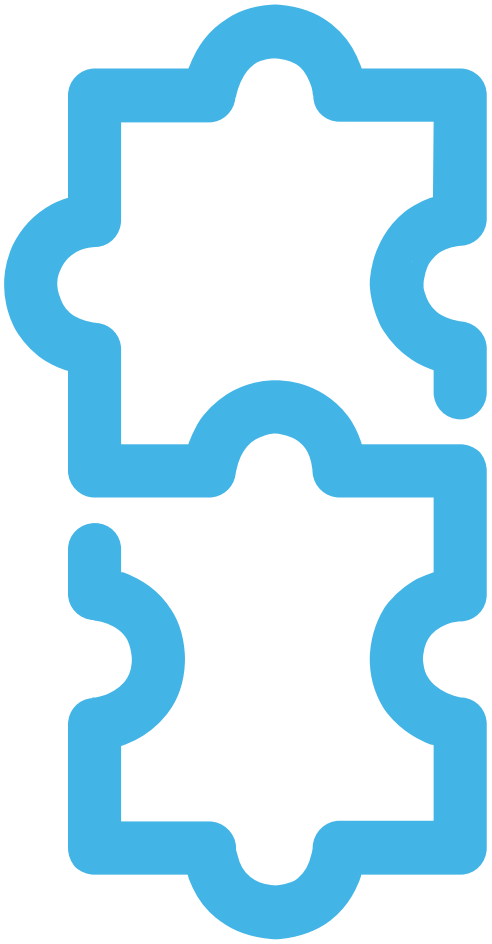


- Free, online e-learning means you don't have to travel to discover energy efficiency.
- Courses can be taken anywhere there is an internet connection.

The course schedule is your schedule

- 24 hour access means you can learn when you want, at your convenience

You tailor your curriculum



- Energy University encompasses the wide range of systems consuming energy or influencing energy use in industry and buildings.
- Thousands of users access Energy University to increase their awareness of energy efficiency opportunities and how to select and acquire solutions

Content and sources

- **Phase 1: Energy Management classes**
  - Broad EE content
  - Understand the opportunities for EE in a range of applications
  - 41 classes available today
  - More every month

- **Phase 2: EE Basics for Key Segments**
  - Short introductions to the main EE trends and opportunities in healthcare, hotels, water, cement, etc
  - Started in early 2011

- **Phase 3: Advanced topics**
  - More advanced content for specific topics or segments
  - Buildings, Power, etc
  - 7 Data Center classes available today
  - More being added each month

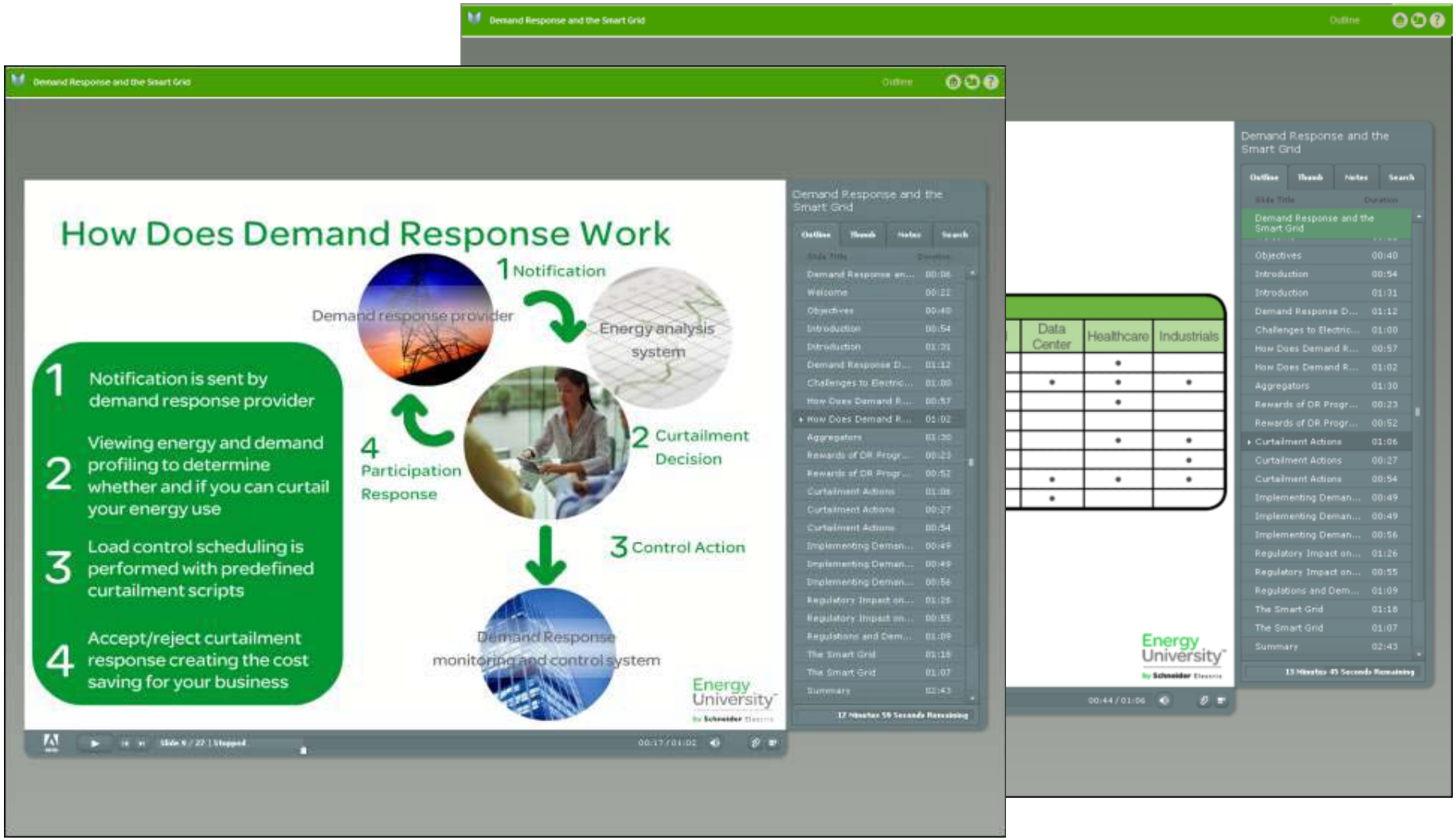
Multiple languages

- All content is available in **English**

- Selected classes are available or coming soon in:

  - Chinese
  - Spanish
  - Portuguese
  - French
  - Italian
  - German
  - Russian
  - Turkish
  - Korean
  - Dutch
  - Arabic

Easy to follow visuals and audio



Every class features

- Vendor and product neutral content
- Practical, fast-acting solutions to save energy
- Overviews of applications and the energy pain points
- Calculations to estimate the savings potential
- Pros and cons of different solutions
- Downloadable course transcripts and other materials
- A quiz at the end to test your learning
- Our portal records your progress
- Our LinkedIn group provides a forum for discussion

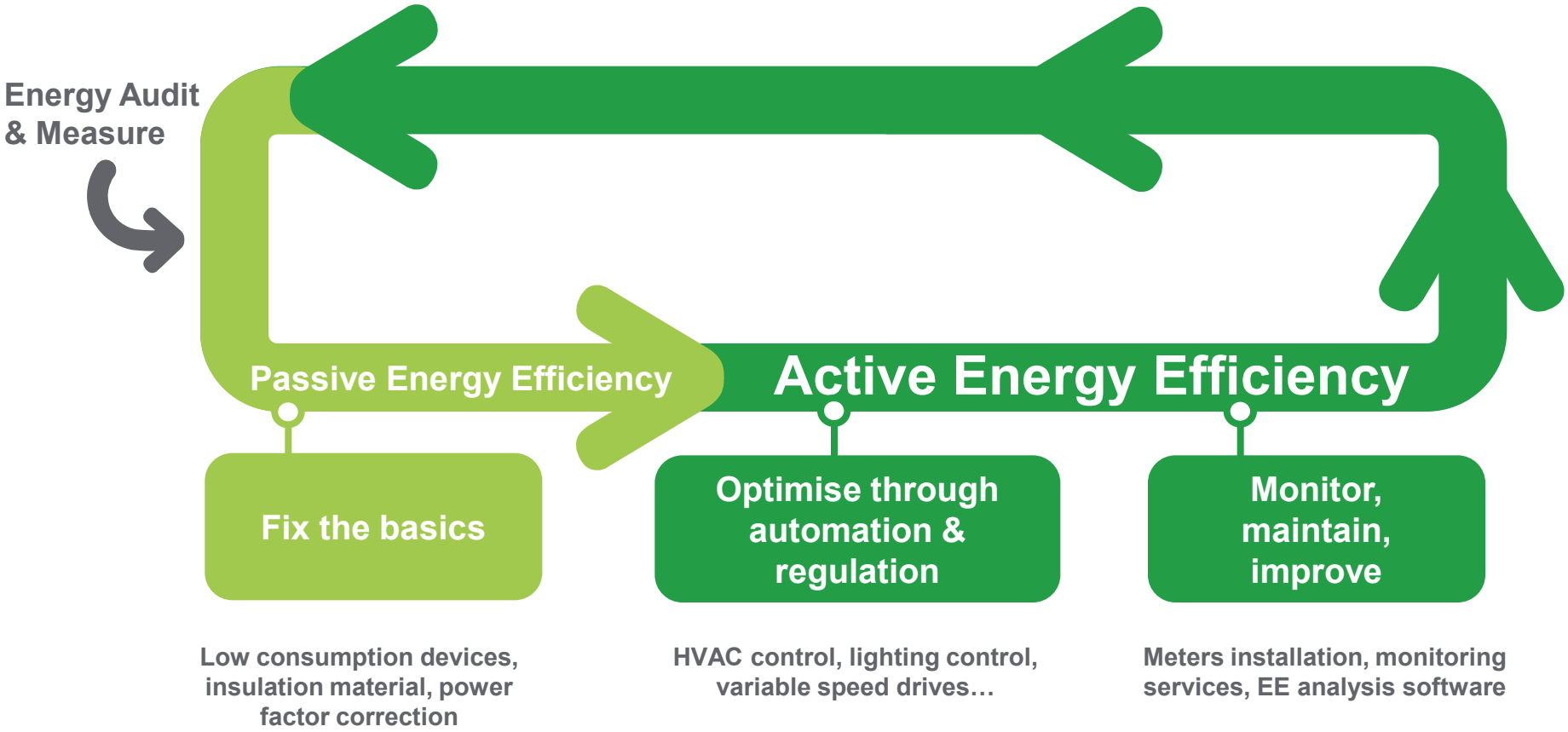
The result?

- Create awareness of opportunities
- Motivate dialogue with experts
- Equip users to prioritize projects and acquire solutions

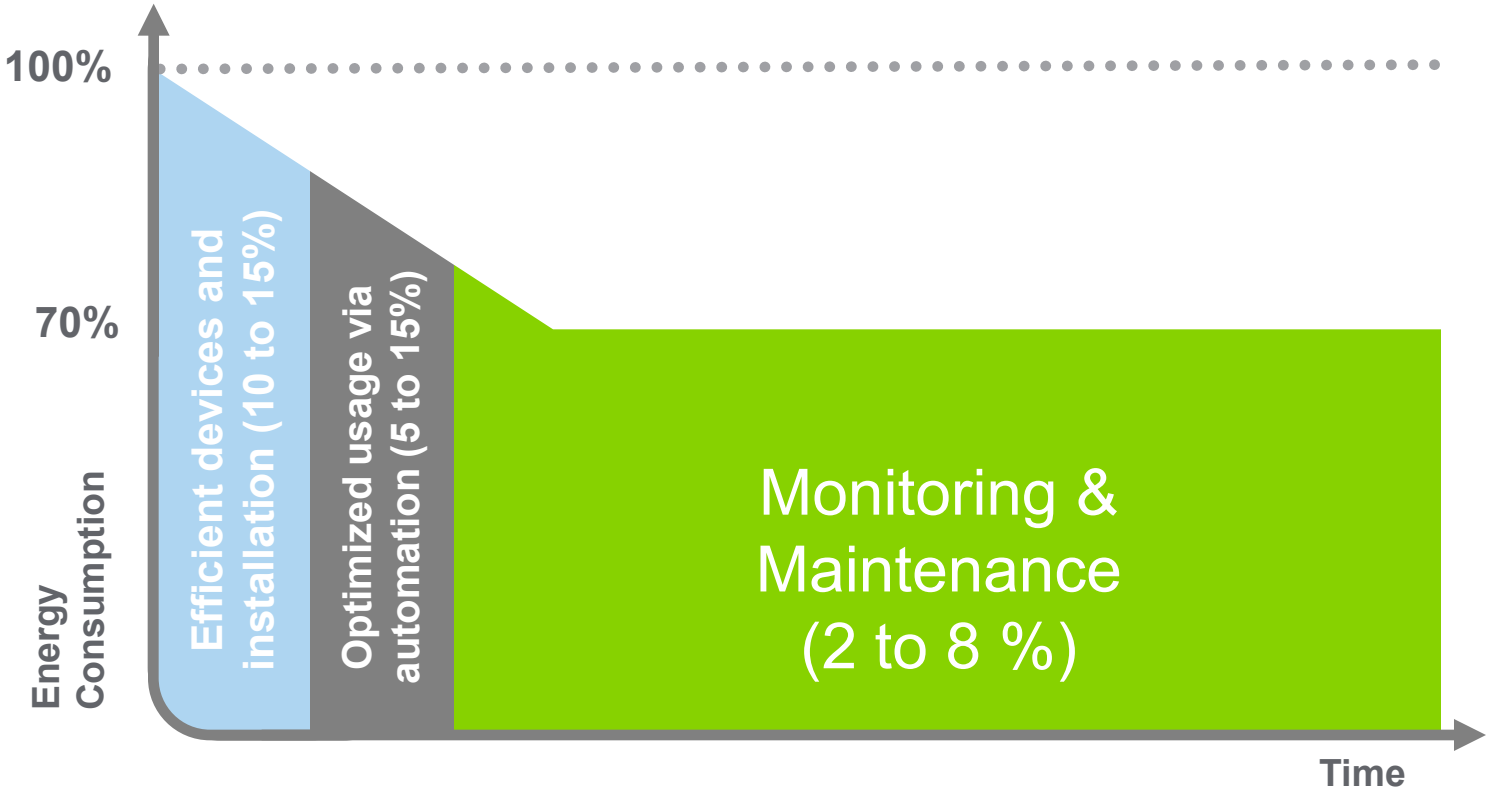
Go beyond passive efficiency to active EE

- Efficient devices and efficient installation (10 to 15 %)
  Low consumption devices, insulated building…
- Optimized usage of installation and devices (5 to 15%)
  Turn off devices when not needed, regulate motors or heating at the optimized level…
- Permanent monitoring and improvement program (2 to 8%)
  Rigorous maintenance program, measure and react to deviation

The energy efficiency lifecycle

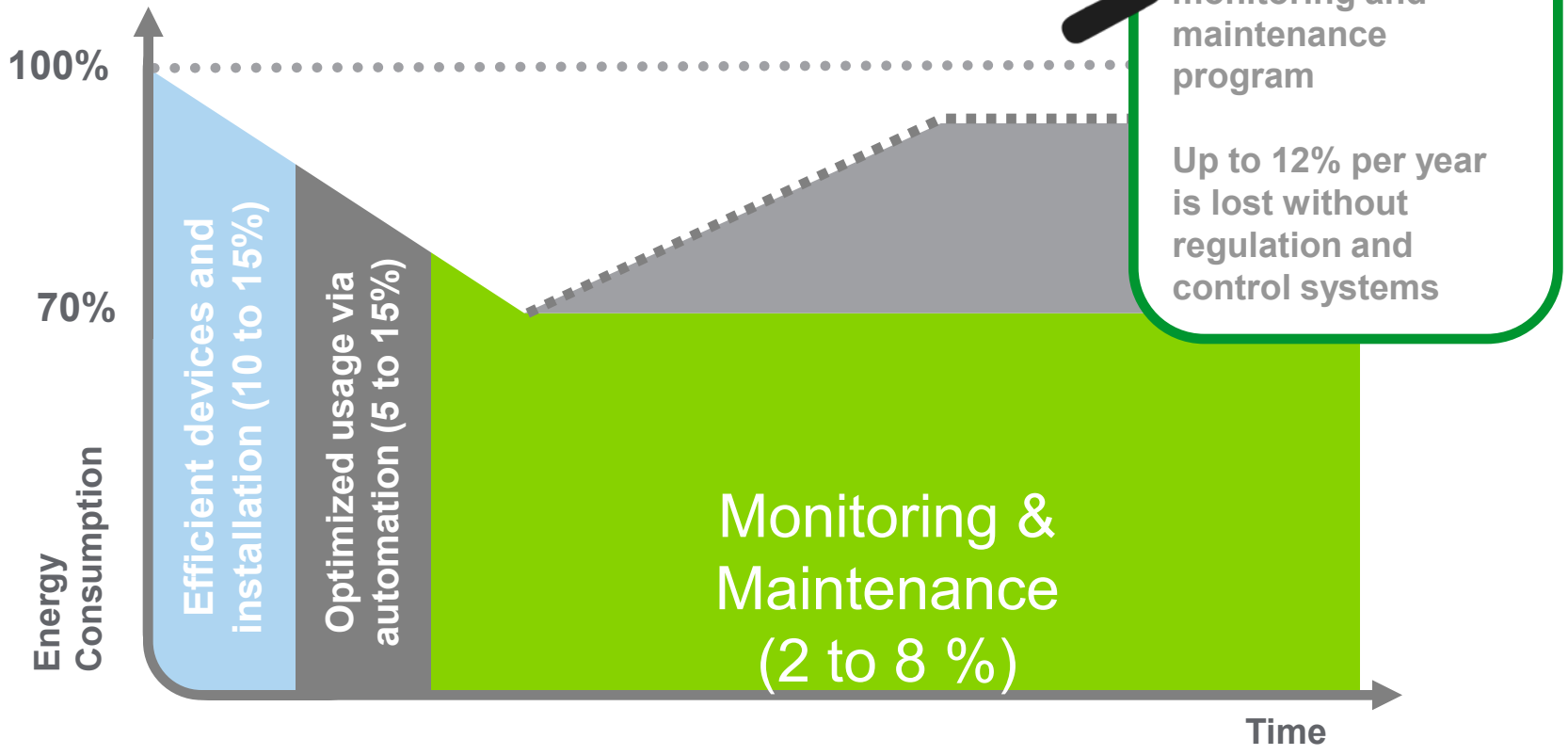


30% savings are available today…



… but savings can be lost quickly

- Unplanned, unmanaged shutdowns of equipment and processes
- Lack of automation and regulation (motors, heating)
- No continuity of behaviours



Energy Management classes available now

- Energy Units and Concepts
- Fundamentals of Energy Efficiency
- Codes and Standards (North America)
- Going Green with LEED
- Lighting (3 classes)
- The Economics of Energy Efficiency
- Energy Audits
- Energy Audit Instrumentation (2 classes)
- Demand Response and the Smart Grid
- Measuring and Benchmarking Energy Performance
- HVAC and characteristics of air
- HVAC psychometric charts (US)
- Power Factor Correction and Harmonics
- Industrial Insulation (2 classes)
- Financing & Performance Contracting for EE Projects
- Energy Rate Structures (2 classes)
- Measurement and Verification including IPMVP
- EE with Building Automation (2 classes)
- Combined Heat and Power
- Distributed Generation
- Building Envelope
- Energy Procurement Part 1
- Maintenance and active EE
- Commissioning and active EE
- Waste heat recovery
- Steam systems (6 classes)
- Thermal energy storage
- Building controls (8 classes)
- Fan systems (4 classes)

Energy Management classes coming through 2011

- Fans and Ventilation (2 classes)
- Strategic Energy Planning
- Pumping Systems
- Motors and Passive EE
- Compressed air: saving energy with automation
- HVAC system and equipment optimization
- Compressed air: optimizing distribution
- Introduction to Boilers and Thermal Systems
- Boilers and combustion efficiency
- Steam distribution systems
- Organizing an effective energy program
- Proven strategies for energy efficient hospitals
- Proven strategies for energy efficient water
- Proven strategies for energy efficient hotels
- Smart Grid
- Electric Vehicles
- Carbon
- Green Computing
- Sustainable Operations
- Revision of lighting content
- HOMES program/Green buildings
- Alternative power (solar/wind)

Recognized as a continuing education provider (more located on our website)

- **The U.S. Green Building Council (USGBC)** is a nonprofit organization committed to a prosperous and sustainable future through cost-efficient and energy-saving green buildings. USGBC works toward market transformation through its LEED green building certification program, robust educational offerings, the annual Greenbuild International Conference & Expo, and advocacy in support of public policy.

- The **IEEE** is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity.

- **The Renewable Energy & Energy Efficiency Partnership (REEEP)** is a non-profit, specialist change agent aiming to catalyse the market for renewable energy and energy efficiency, with a primary focus on emerging markets and developing countries. It is comprised of 300 partners including 46 governments as well as a range of private companies and international organisations.

Energy efficient behaviors require education to be sustained…

…and there's a free, on-line, vendor-neutral platform that exists to help facilitate this need.

www.MyEnergyUniversity.com