كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Saudi Energy Efficiency Center

Dr. Naif M. Alabbadi
SEEC, Director General

nabbadi@seec.gov.sa

www.SEEC.gov.sa

AFED 6th Annual Conference
Sustainable Energy: Prospects, Challenges, Opportunities
Sharjah 28-29 October 2013

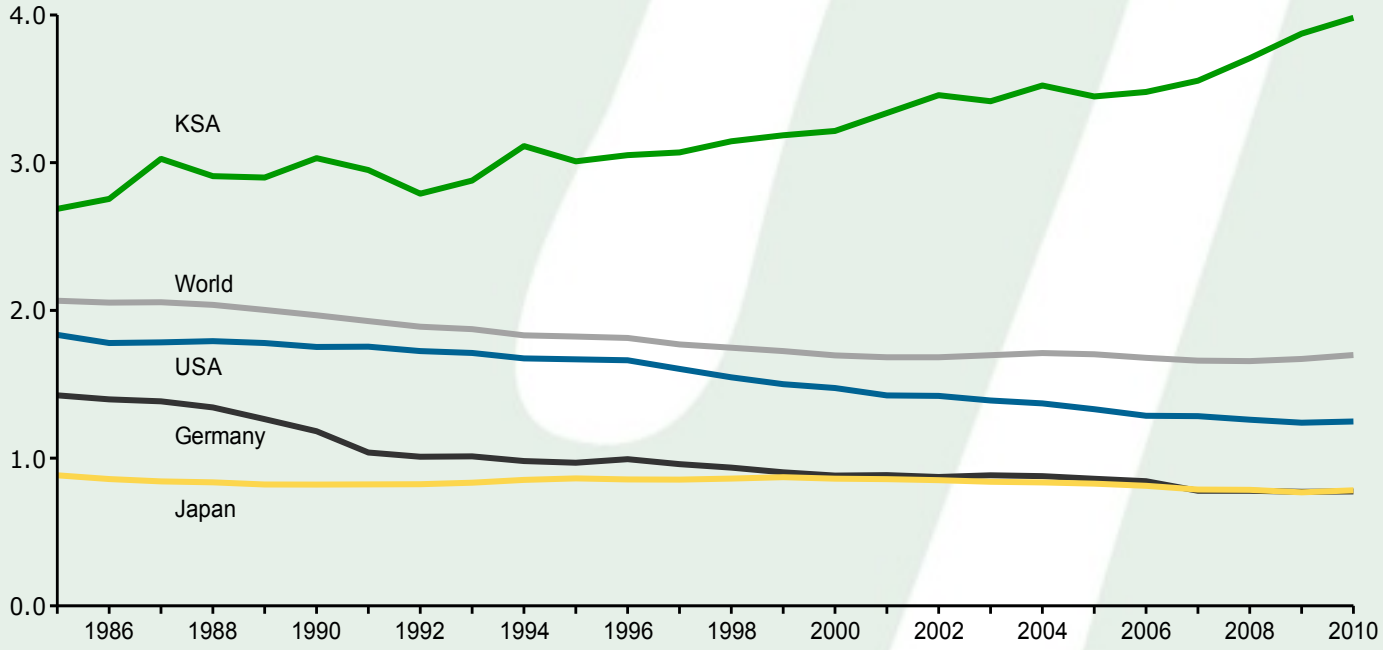
AFED
المنتدى العربي للبيئة والتنمية
ARAB FORUM FOR ENVIRONMENT AND DEVELOPMENT

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Presentation Outline

- Background
  - Necessity and potential for EE
  - EE Journey in KSA
- Establishment of SEEC
  - SEEC Setup
  - Mission & Objectives
  - Sample of activities
- Saudi Energy Efficiency Program; SEEP
  - Start, Scope and Setup
  - Working principles
  - Samples of achievements

KAS Energy Intensity

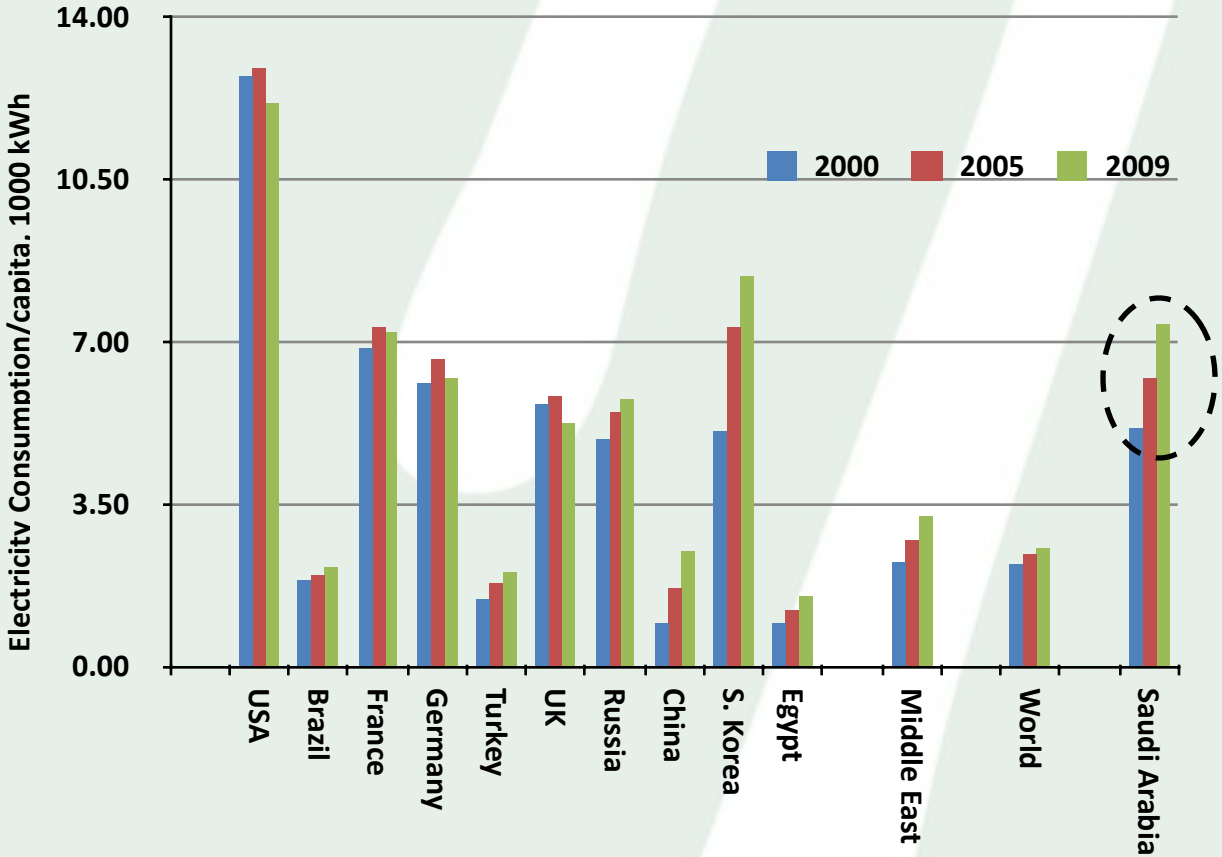


	CAGR (1985-2010)	Overall growth (1985-2010)
KSA	3.8%	48%
World	-0.5%	-18%
USA	-0.8%	-32%
Germany	-0.9%	-46%
Japan	-0.4%	-11%

- EI showing an increasing trend since 1985
- EI in KSA has shown an overall growth ~ 50%
- EI ~ twice the world average in 2010

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Electricity Consumption per capita

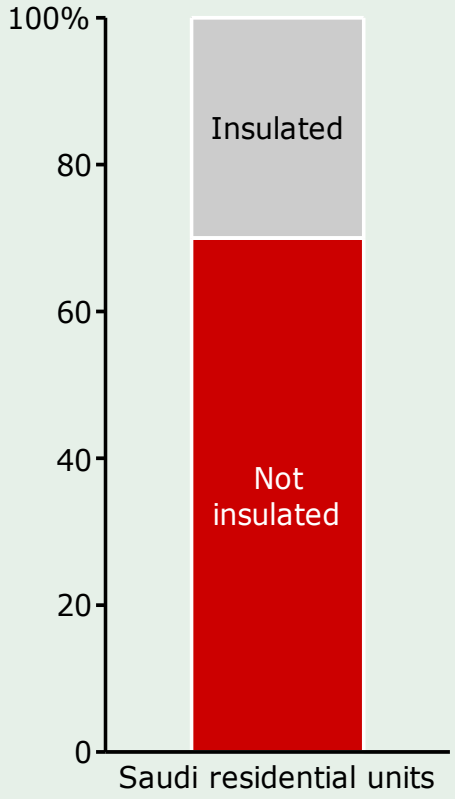


Electricity consumption per capita is three times the world average

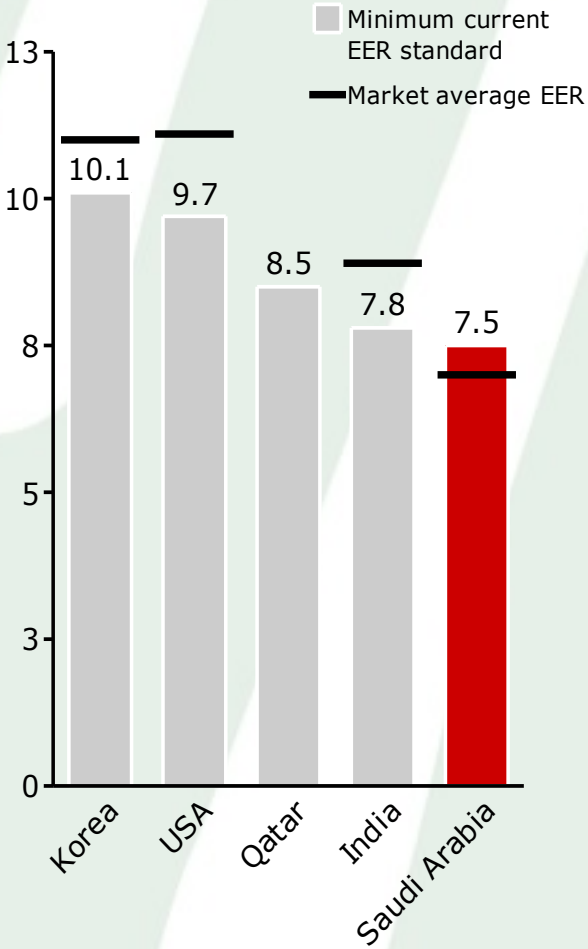
كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Energy Efficiency in Buildings

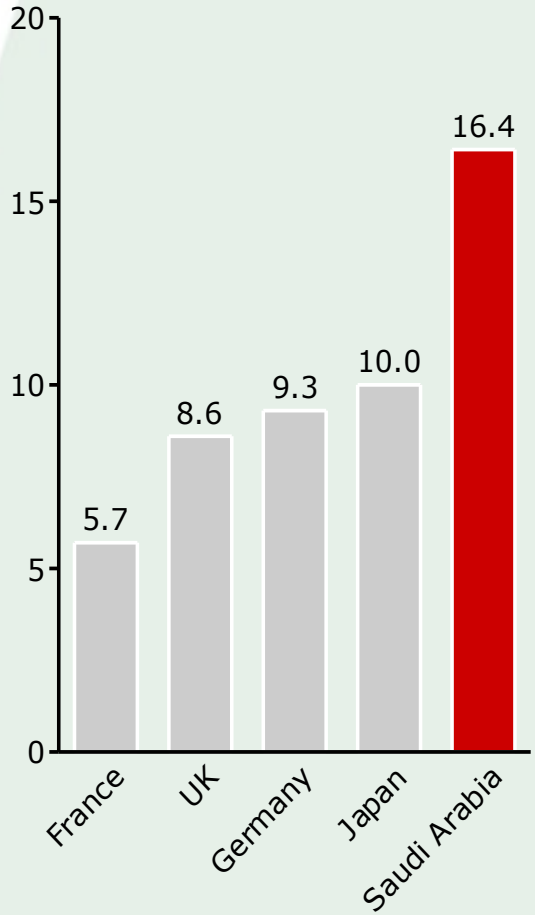
Insulation in Saudi residential buildings



A/C energy efficiency rating

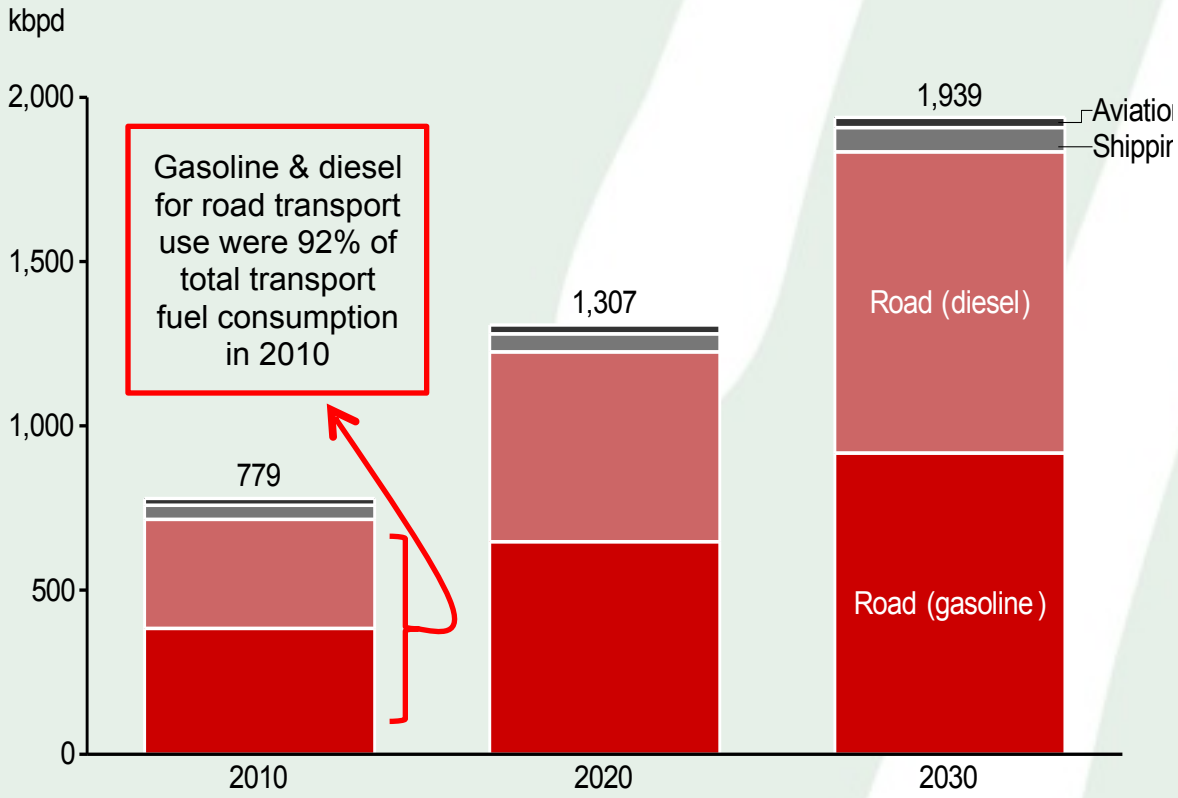


Lighting electricity consumption (kWh/m2 p.a.)

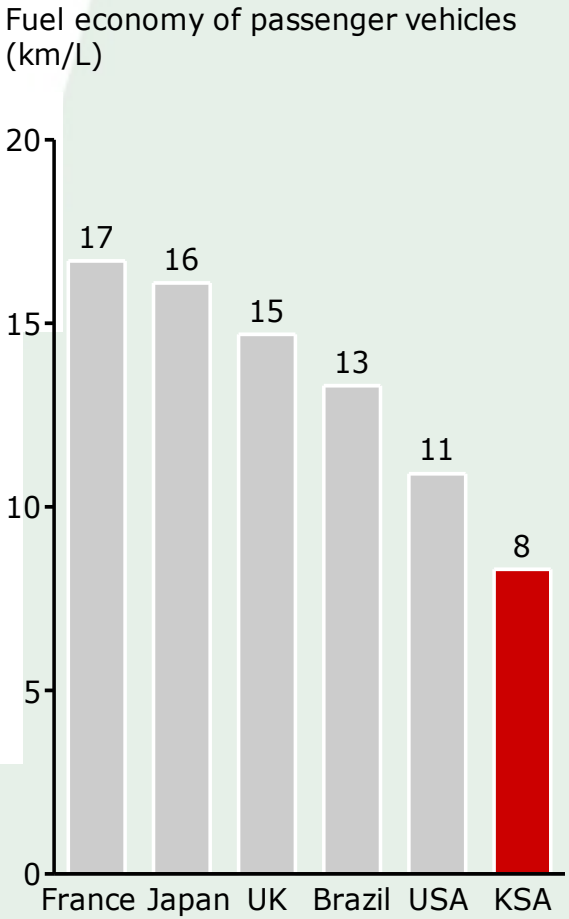


كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Energy Intensity in the Transportation Sector



Source: Saudi Aramco



كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

KSA Energy Efficiency journey started almost a decade ago, and lead to the creation of SEEC and the start of the EEP

2003

Launch of a national effort (NEEP) to enhance demand-side energy efficiency (focused on electricity) in collaboration with public and state-own enterprises

2007 - 10

Initiative by the Ministry of Petroleum to transfer the National Energy Efficiency Program to a permanent entity: the Saudi Energy Efficiency Center, established in October 2010 by the Council of Minister

2012

Inter-agency effort to launch the Energy Efficiency Program(EEP)

Saudi Energy Efficiency Center (SEEC)

Established by the council of ministers decision 363 dated (24/11/1431; 31 October 2010) that mandated the transfer of NEEP to a Permanent National Center for Energy Efficiency named: Saudi Energy Efficiency Center.

- Temporary within KACST's and report directory to KACST's president.
- SEEC is Supervised by a committee composed of representatives from related stakeholders

SEEC's Management Committee

Chairman; KACST's President

Ministries

- Petroleum & Minerals
- Water and Electricity
- Municipality and Rural Affairs
- Commerce and Industry
- Transportation
- Culture and Information
- Housing
- Finance

Other governmental entities

- Presidency of Meteorology and Environment
- King Abdullah City for Atomic and Renewable Energy
- Saudi Standards, Metrology and Quality Organization
- Electricity & Co-Generation Regularity Authority
- Saline Water Conversion Corporation
- Designated National Authority

Companies and Private Sector

- Saudi Aramco
- Saudi Electricity Company
- SABIC
- Two representatives from the private sector

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

SEEC's Mission

Support preserving the national energy resources to enhance the national development and economy through the rationalization of energy consumption and improving energy efficiency in order to achieve the lowest possible levels of energy intensity.

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

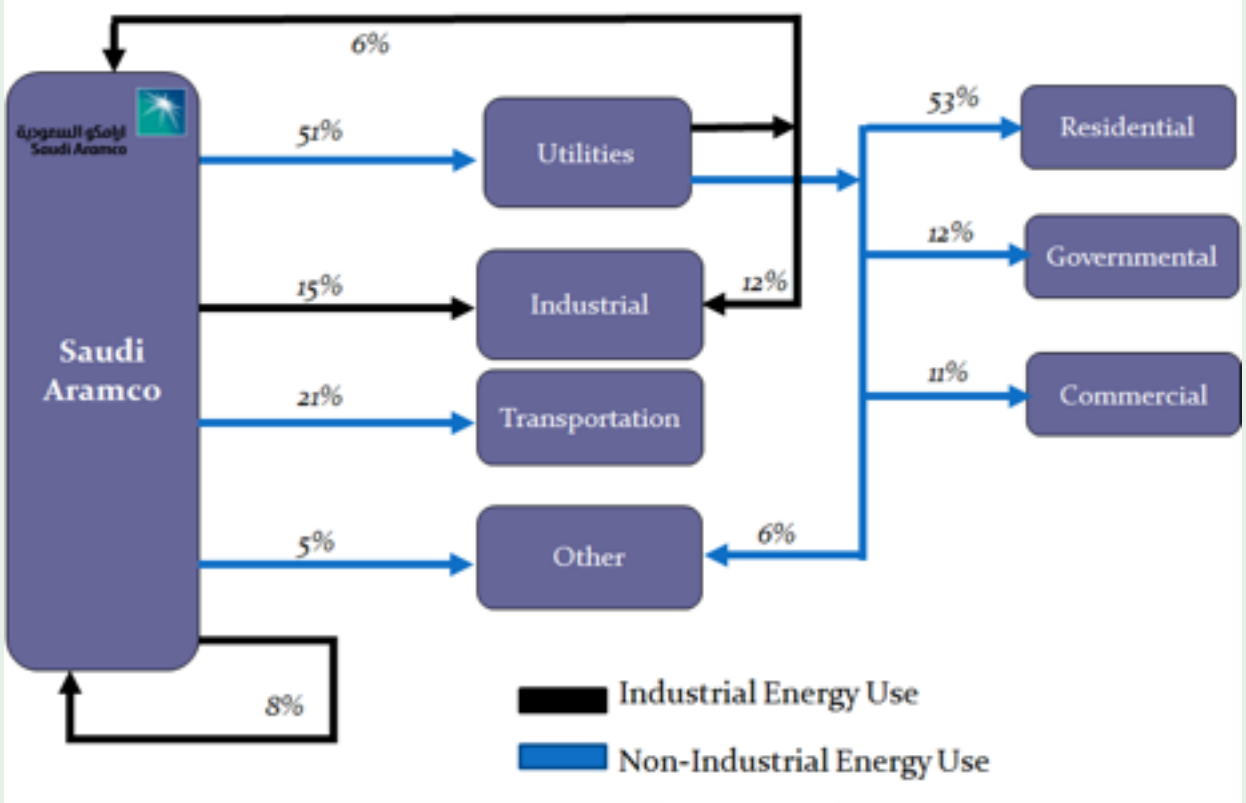
SEEC's Mission…continue

SEEC's main activities include:

- ✓ Development of National Energy Efficiency Program.
- ✓ Support the integration of the stakeholders' efforts to improve EE and coordination amongst them.
- ✓ Promote EE awareness at both public and institutional levels.
- ✓ Support building capacity in EE.
- ✓ Participate, as needed, in the implementation of EE pilot projects.

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Energy Flow in KSA



SEEP's Objectives and Scope

SEEP objectives

- Improve Kingdom's energy efficiency (EE)
- Set EE goals by sub-sectors to be revisited regularly
- Design the EE initiatives and their enablers
- Involve key stakeholders: Government, businesses, and public

---

SEEP scope

- Focus on demand side only for 3 sectors: Buildings, transport, and industry
- 3 sectors covered represent ~ 90% of the Kingdom's internal energy consumption

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

SEEP Developments' Principles

Developing phase:

- ✓ Technical developing teams composed from all related organizations and lead by the most relevant.
- ✓ Secure consensus and agreement of all stakeholders (including private sector).
- ✓ SEEP has to enable all related organizations to achieve the EE goals.

Implementation phase:

- ✓ Have an updating mechanism.
- ✓ Preserve the mandates of each governmental organization and ensure their accountability.
- ✓ SEEC will coordinate, monitor and support.

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

SEEP has mobilized approximately 70+ engineers/specialist from 20+ organizations

Sub-Committee Chairman (HRH Prince Abdulaziz bin Salman)

- Deputy Minister, Ministry of Commerce & Industry
- Deputy Minister, Ministry of Water & Electricity
- Deputy Minister, Ministry of Housing
- Deputy Minister, Ministry of Transportation
- Vice Governor, ECRA
- Secretary General of Public Investment Fund, Ministry of Finance
- Adviser for Minister, Ministry of Municipality & Rural Affairs
- Chief Engineer, Saudi Aramco
- Assistant Deputy Minster of Ministry of Commerce & Industry
- Director General of Quality Assurance, Saudi Standard Organization
- Director General, Saudi Energy Efficiency Center
- Director, Designated National Authority
- Executive Vice-President, SABIC
- Executive Vice President of Distribution and Customer Service, Saudi Electricity Company

Technical teams

Buildings
- Members from SASO, SEEC, SEC, S. Aramco, ECRA, MoMRA, MoH, SABIC, KACARE, Customs, MoWE

Transportation
- Members from SASO, SEEC, MoT, Traffic Police, Customs, S. Aramco

Industry
- Members: SABIC, Saudi Aramco, SEC, MoCI, ECRA, SEEC

Awareness
- Members from Saudi Aramco, SEEC, Al Jazeera, MoWE, Ministry of Culture & Information

Urban Planning
- Members from Modon, ARDA, SRO, MoWE, MoT, S. Aramco

Funding
- Members from Aramco, SEEC, ECRA, DNA, MinPet, World Bank, MoF

TIC
- Members from SEEC, Customs, MoCI, SASO

EE Law
- Members from MinPet, SEEC, Saudi Aramco, Int'l law firm

ESCOs
- Members from Aramco, SEEC, World Bank, GIZ

المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

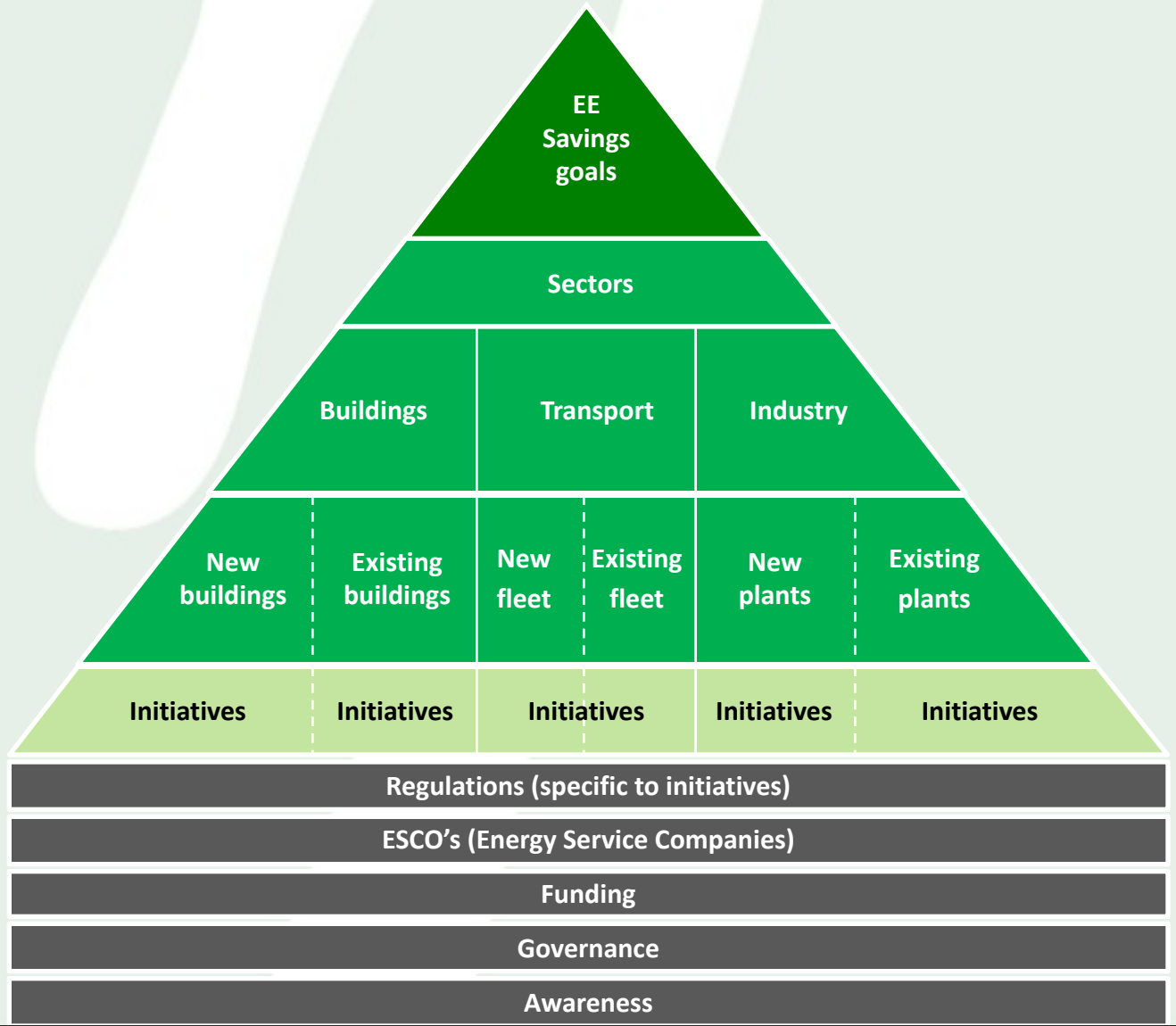
The Saudi EE Program framework is organized around 3 sectors and 5 enablers

EE savings

6 EE sub-sectors with EE savings goals

Initiatives to achieve the EE savings goals

Enablers to implement initiatives



كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Guiding principles for designing SEEP

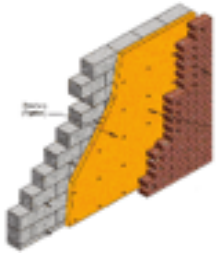
1	Purely focused on **demand-side management**
2	Program design should not include price reform
3	Initiatives to be designed based on end-user impact (e.g. payback period)
4	Consensus driven Energy Efficiency initiatives e.g. baseline and savings goals by consensus

Buildings: EE effort focused on A/C, insulation, white goods, lighting and the Saudi Building Code

Air conditioners

- Very low efficiency standards
- Lack of enforcement mechanism

Insulation



- No efficiency standards
- No enforcement mechanism

Lighting

- No efficiency standards
- No enforcement mechanism

Saudi Building Code EE section (601)

- Complex
- Long
- Outdated
- Not enforced

Buildings: Samples of Initiatives

Validated buildings baseline



- Buildings consumed ~80% of the total electricity consumption
- A/C consumed ~70% of building electricity consumption (equal to ~50% of total electricity consumption

Finalized high impact EE initiatives

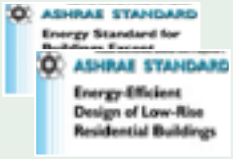

- Standard / regulation updated, and EER(1) MEPS(2) ramp-up plan is issued
- Mandate insulation for new buildings

Launched 1st wave of lead-by-example initiatives for new gov. buildings

- Signed memorandums of understanding between SEEC and five entities to ensure application of EE guidelines

Validated high impact EE initiatives on insulation & SBC(3) 601



- Engaged ASHRAE to develop insulation standard and regulation, and initiated product control process development

(1) Energy Efficiency Rating, (2) Minimum Energy Performance Standard, (3) Saudi Building Code – Energy Conservation section

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Transportation EE for new and on-the-road LDVs and HDVs

Light-Duty Vehicles		Heavy-Duty Vehicles	
On-the-road	New	On-the-road	New
			

Lack of transportation alternatives (buses, passenger trains, freight railways, etc.)

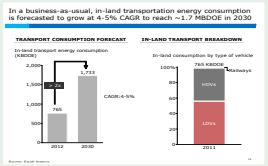
Lack of penalization / incentivisation system

Lack of standards & labeling

Significantly large old on-the-road fleet

Transportation: Samples of Initiatives

Validated baseline and developed global benchmarks

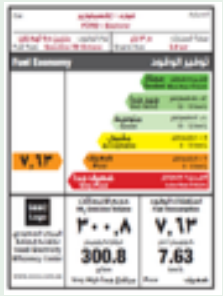


- Developed analysis for new incoming LDVs and on-the-road LDVs fleet
- Developed comprehensive understanding of LDVs/ HDVs initiatives implemented globally

Mandated Fuel Economy reporting for LDVs

- SASO requested mandatory FE reporting on Model Certificate of Conformity from GSO (expected for 2015 model year)

Developed Fuel Economy labeling for LDVs



- Finalized the development of the LDVs fuel economy label

Defined rolling-resistance standard for tires

- Drafted preliminary proposal
- Organized workshop with tire manufacturers to share proposed standard and receive input

Industry: EE for Cement, Steel, Petrochemical sub-sectors and industrial equipment

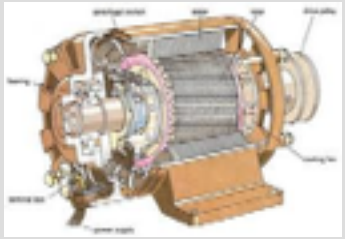
Cement

Steel

Petrochemical

- No energy efficiency targets for existing plants
- No energy efficiency requirements for new plants approval process
- No established baseline for production output and energy consumption

Industrial equipment



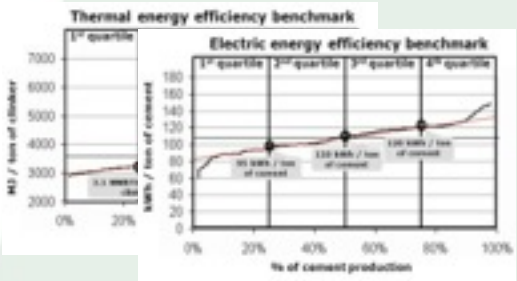
- No energy efficiency standards (MEPS)
- No labeling
- No mapping of imports and local manufacturers

Industry: Samples of Initiatives

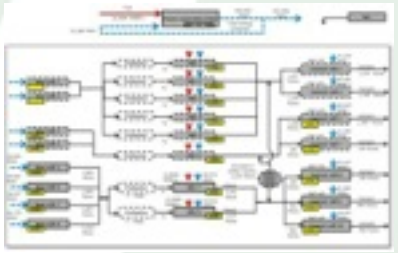
Industry subsectors

Energy efficiency targets

- Energy efficiency targets for new and existing plants
  - Defined and validated for cement
  - Currently being finalized for steel and petrochemical



Baseline and plant visits

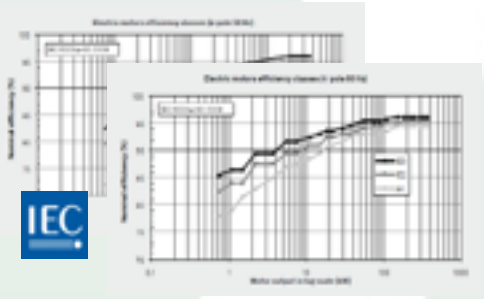


- Plant visits and mapping completed
- Baseline , production and consumption data collected (under validation)

Enforcement mechanism – new plants

- Enforcement mechanism for new plants completed

Industrial equipment – electric motors



- Benchmarking of international policies and standards completed
- Baseline process started with customs and main industrial players

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

SEEP Overall Progress

- ✓ The other five technical teams have shown similar progress.
- ✓ Engagement of all stakeholders was ensured through face-to-face meetings, technical workshops…
- ✓ Best practices and international experiences have been an important element for SEEP's development.

كفاءة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

Conclusions

- **Energy intensity of the Kingdom has grown significantly over the last 25 years.**
- **SEEC has been tasked to reduce Saudi Arabia's energy consumption and improve its energy efficiency capitalizing on its strongest asset "the integrated inter-agency cooperation".**
- **SEEC is developing EEP, a necessary and ambitious program where all stakeholders partake in the making and delivery.**

كفاءة

المركز السعودي لكفاءة الطاقة

Saudi Energy Efficiency Center

THANK YOU