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**Energy Efficiency and Sustainable Use of Traditional and New Energy Sources**

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 UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

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**OUTLINE**

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- RENEWABLE ENERGY**
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Poverty Reduction through Productive Activities • Trade Capacity Building • Energy and Environment



## CONTEXT

### GLOBAL CHALLENGES

➤ Energy Poverty

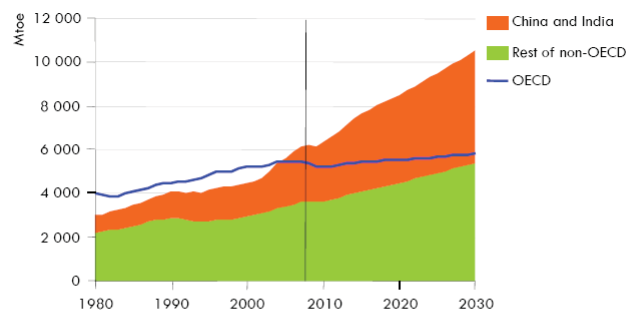
➤ Energy Security

➤ Climate Change

- Access to Energy: A Pre-requisite for Poverty Reduction and Achievements of MDGs
- Energy Efficiency: Low hanging fruit with huge potential for improving Productivity and GHG mitigation



## World primary energy demand under reference scenario

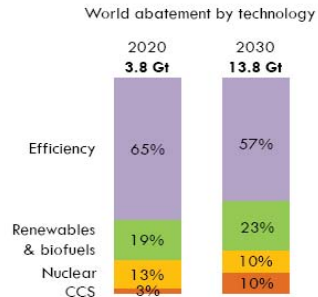
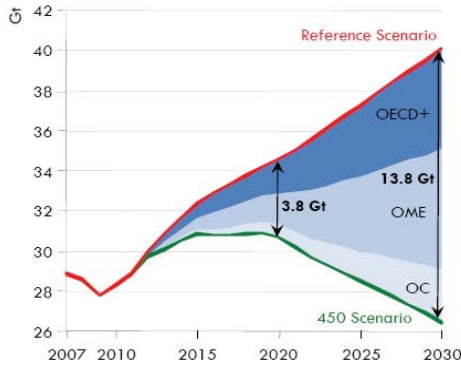


*Non-OECD countries account for 93% of the increase in global demand between 2007 & 2030, driven largely by China & India*

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### World abatement of energy related CO<sub>2</sub> emissions in the 450 scenario



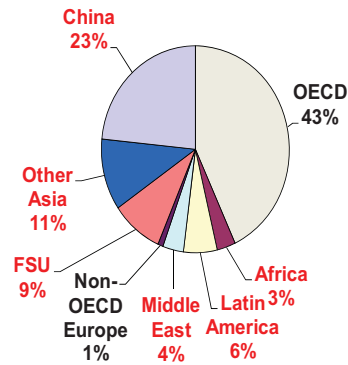
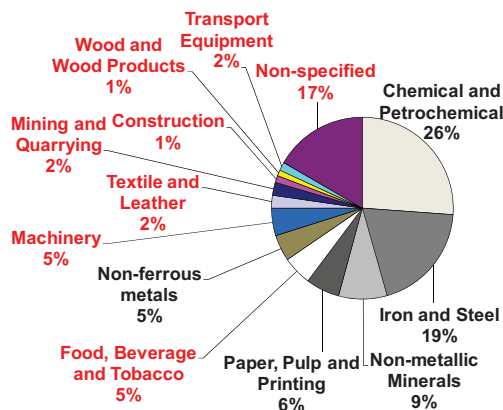
An additional \$10.5 trillion of investment is needed in total in the 450 Scenario, with measures to boost energy efficiency accounting for most of the abatement through to 2030

© OECD/IEA - 2009



### Industrial Energy Use, 2006

121 EJ final/156 EJ primary energy use – 1/3 of total global energy use

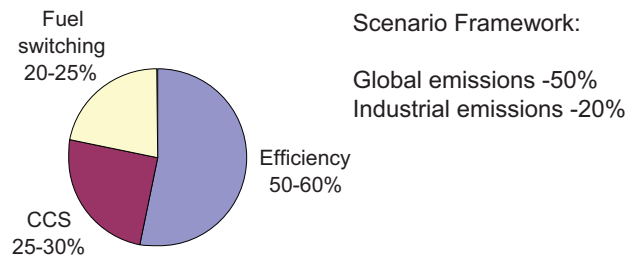


7.1 Gt CO<sub>2</sub> – 25% of total E&P CO<sub>2</sub> (direct emissions) – 40% direct + indirect



## CO2 Emissions Reduction Potentials in Industry

Long-Term CO2 Emissions Reduction Potentials in Industry  
(compared to Baseline, 2050)  
(IEA, *Technology Transitions for Industry*, 2009)



Efficiency (on top of baseline) constitutes half of the potential  
This requires a doubling of the technical efficiency improvement rate



## UNIDO's Energy Management Model – Strategic Approach

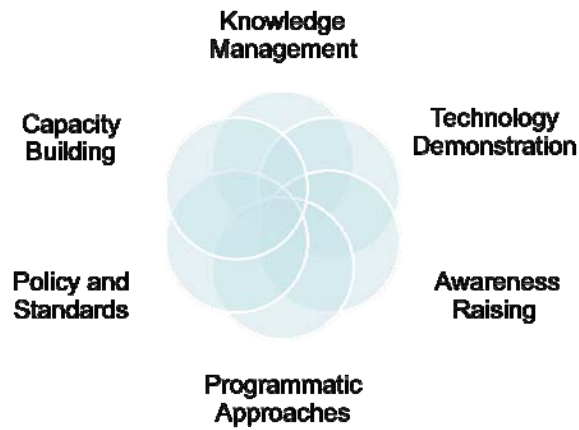
The **Energy Management model** that UNIDO advocates and supports at global, regional and country level is hinged on the core pillars of **energy management systems, energy efficiency, renewable energy and transfer of low-carbon and climate change mitigation technologies and practices**





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## UNIDO Energy Strategy: Building Blocks



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## Industrial Energy Efficiency

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## UNIDO Industrial Energy Efficiency Programme

### Thematic focus areas

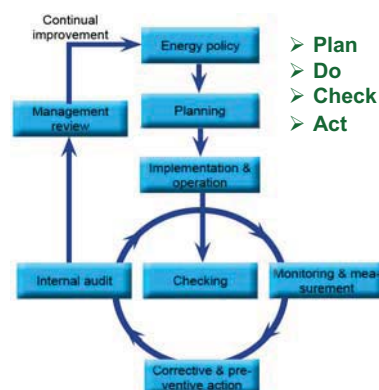
- ❑ Energy management system standards – ISO 50001
- ❑ Energy systems optimization (steam, compressed air, etc.)
- ❑ Advanced process low carbon technologies
- ❑ Hydrogen technology



## UNIDO Industrial Energy Efficiency Programme

### Energy Management System Standards

- ❑ Average annual energy intensity reduction in OECD **enterprises that implemented Energy Management Systems** was more than double the business as usual rate (2.0 – 3.0% against 1.0%)
- ❑ Increasing role for standards as policy-driven market-based tool to mitigate Climate Change while continue to grow → EN 16001, ISO 50001





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## UNIDO Industrial Energy Efficiency Programme

### ISO 50001 - Energy Management Standards

- ❑ Scheduled for release Q3 2011
- ❑ Specifies requirements applicable to energy supply and energy uses and consumption, including measurement, design and procurement
- ❑ Applies to all factors affecting energy use, which can be monitored and influenced by the organization
- ❑ Applies to all organizations independent of size and sector
- ❑ Dissemination of ISO 50001 will be also driven by companies seeking a recognized response to international climate agreements, national cap & trade programs, carbon energy and/or taxes, etc. → **Impact on Competitiveness & Trade**

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## UNIDO Industrial Energy Efficiency Programme

### Energy Systems Optimization Approach in Industry

- ❑ In industry energy efficient equipment per se does not guarantee energy savings when it is part of a bigger system
- ❑ System approach involves looking at how components function together to deliver a certain end-use
- ❑ Energy efficiency improvement potential through system optimization is on average 15-30%
- ❑ Steam and electric motor-driven systems account for more than 50% of final manufacturing energy use worldwide

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## UNIDO Industrial Energy Efficiency Programme

### Energy Systems Optimization - Example



15 kW motor  
efficiency = 91%



Combined motor &  
pump efficiency =  
59%



System efficiency = 13%

Courtesy of Don Casada, Diagnostic Solutions and US Department of Energy

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## UNIDO EE Projects (Best Practices)

- Energy Conservation and GHG Emission Reduction in Township and Village Enterprises (TVE) in China
- Market Transformation Programme on Energy Efficiency in GHG-intensive industries in Russia
- Promoting Energy Efficiency and Renewable Energy in selected Micro, Small and Medium Enterprises (MSME) Clusters in India
- Promotion of Hydrogen Energy Technologies in Turkey
- Improving EE and Promoting RE in the Agro-Food and other SMEs in Ukraine
- Carbon Capture and Storage (CCS) – Industrial Sector Roadmap

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## Renewable Energy for Productive Uses

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## UNIDO's Renewable Energy Programme

### Thematic focus areas

- Renewable Energy for Enhancing Access
- Renewable Energy for Productive Uses
- Renewable Energy for Industrial Applications (Heating and Cooling)

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## UNIDO's Renewable Energy Programme

### Renewable Energy Programme – Main Elements

- Technology demonstration
- Policy Support
- Capacity Building
- Global Forum Activities
- Information Dissemination



### Direct Beneficiaries of RRE's programmes

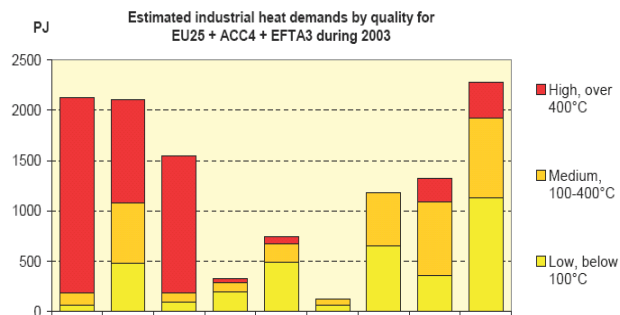
- SMEs in developing countries
- Institutions and enterprises involved in industrial consumption and production using renewable energy technologies
- Local communities



## Industrial Renewable Energy

### RET for industrial applications

- Solar thermal for industrial process heat
- Biomass for industrial process heat





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## Small Hydropower Projects for Rural Electrification in Rwanda

Mini hydropower facilities linked with productive uses  
Nyamyotsi 100kW in operation since August 2006,  
Mutobo 200kW & Gatubwe 200kW in 2008,



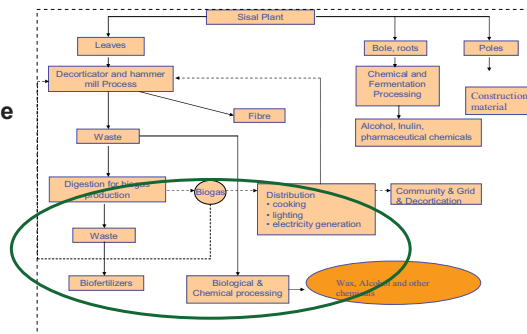
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## Integrating Bioenergy, Waste Recycling and Productive Uses

The production of biogas in Tanzania from Sisal waste and its use as energy source for processing Sisal and other income generation activities






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## Renewable energy-based electricity generation for isolated minigrids in Zambia

The project would install:

-  Biomass gasifier power plant for 1 MW of electricity generation
-  Small hydropower station to generate 1 MW of electricity
-  Solar energy mini-grid with an outputs of 36 kW



The project will also contribute to a legal, institutional and policy framework to provide for a favorable environment for commercial deployment of renewable energy based mini-grids in rural areas of the country

Total project budget: US\$ 6,324,007



## Ecogas Centre for Renewable Energy and Energy Efficiency (ECREEE) in Praia, Cape Verde

The centre focuses on:

- Developing RE and EE markets in West Africa
- Policy and capacity development
- Designing financing mechanisms
- Implementing demonstration projects with potential for regional scaling-up



The official opening of Regional Centre for Renewable Energy and Energy Efficiency held on 6 July 2010 in Praia, Cape Verde

ECREEE is a specialized institution of the Economic Community of West African States supported by UNIDO, the Governments of Austria, Cape Verde and Spain

Total project budget: US\$ 2,692,566



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## Regional Observatory for Renewable Energy in Latin America and the Caribbean

- ❑ Tool to promote renewable energy, in particular for productive uses and industrial applications
- ❑ In total 20 countries in LAC endorsed the programme and activities already initiated in 8 of them
- ❑ Relies on a powerful knowledge platform
- ❑ The main goals are:
  - increasing the access to the existing know-how,
  - promoting that member countries see their renewable energy generating capacity and ability to attract investments strengthened



Opening session of the Iberoamerican Ministerial Meeting, held in 2006 in Montevideo, Uruguay



Total project budget: US\$ 3,336,897

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## CHALLENGES AHEAD

- Time for Energy Transition and Transformation
- Year for Sustainable Energy for All - 2012
- SG's AGECC Report - A Framework for Action – Universal Access by 2030 and Reduction in Energy Intensity by 40 % by 2030



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THANK YOU !

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