

# **Energy Efficient Prosperity**

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IEA #energyefficientworld



doing the same with less

#### to

# doing more with the same

## to

# doing even more with more

## to

# raise standards of living and promote energy efficient prosperity

#### **Multiple Benefits of Energy Efficiency**





# Energy Efficient Prosperity

Energy efficiency as a means to support economic and social development, while ensuring environmental sustainability

#### **Multiple Benefits of Energy Efficiency**







# **Energy security**

#### Energy security: State of imports

#### Fossil fuel trade balance in Southeast Asia in the 2017 New Policies Scenario



#### A traditional net energy exporter, Southeast Asia's oil and gas import bill could reach over \$300 billion by 2040 as energy demand grows rapidly

## Saving opportunities in the Sustainable Development Scenario

Primary energy demand: New Policies and Sustainable Development Scenarios



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# Air quality

## Air quality





#### Air quality





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#### Air quality: current status



Early 2019 saw Bangkok go through one of the highest air pollution levels. The temperature and local climate conditions aggravate the situation by reducing the dispersal of the emissions.

#### Impacts of air pollution in Southeast Asia





This is not confined to Bangkok. Southeast Asian cities regularly experience toxic air pollution and costs due to premature death are high



- Air pollution is 4<sup>th</sup> largest risk to human health
- 3 million premature deaths are linked to outdoor air pollution, mostly in cities
- **3.5 million premature deaths** are linked to energy poverty due to the use of **biomass for cooking and kerosene for lighting**

#### Emissions: many causes and cures are in the energy sector



#### Reducing emissions through the Clean Air Scenario



Pollutant emissions savings by measure in Southeast Asia in the Clean Air Scenario relative to the New Policies Scenario, 2040



Fortunately, there is an opportunity to reduce these things by adopting policy measures in a Clean Air Scenario: 75% lower SO2 and NOx and 85% lower PM2.5, mostly energy efficiency-driven

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Source: World Energy Outlook 2016 Special Report on Energy and Air Pollution 15

#### Reducing emissions through the Clean Air Scenario





Premature death cases and loss of life expectancy in Indonesia

Note: NPS = New Policies Scenario; CAS = Clean Air Scenario.

Source: IIASA.

These measures contribute to reduction of premature death and loss of life expectancy. In Indonesia, as more than 140 000 premature deaths can be avoided



# Role of fossil fuel energy subsidy phase out

- A deliberate policy action by government that specifically targets a particular energy source (e.g. coal, oil, gas, electricity) with one or more of the following effects:
  - 1. Reducing the net cost of energy purchased
  - 2. Reducing the cost of production or delivery of energy
  - 3. Increasing revenues retained by energy suppliers
- Consumer subsidies distort the price for energy (the amount paid by consumers does not reflect the actual cost)

#### **Fossil Fuel Subsidies are roughly:**

- 4 times level of renewable energy subsidies
- 4 times OECD Development Assistance
- 6 times the amount needed for meeting climate finance objectives
- 22 times the size of current donor adaptation funds

#### Who are the real beneficiaries of subsidies?

Global survey of energy subsidy beneficiaries



Despite the good intentions behind subsidies, the bulk of them are actually enjoyed by the upper socioeconomic classes instead of the lower ones

## **Expenditure of fossil fuel energy subsidies**





#### Fossil-fuel consumption subsidies by country, 2017 (billion USD)

#### Global subsidies in 2017 is estimated at more than USD 300 billion

#### Expenditure of fossil fuel energy subsidies



#### There are still substantial amounts of subsidies in Southeast Asia, reaching USD 20.2 billion

### Subsidy reform has an immediate benefit to budgets



Significant levels of gasoline subsidy removed in 2015 and diesel subsidy in 2016 aided by low global oil prices

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## Fossil fuel subsidies do not align with sustainable development goals





#### Subsidy reform via energy efficiency: A virtuous circle



Energy efficiency makes subsidy reform more politically feasible Subsidy reform makes energy efficiency more attractive



Reform though is politically difficult, but energy efficiency swaps can be an innovative way to achieve reform.

#### Subsides can be switched to other forms of support







Switching support away from fossil fuel subsidies to energy efficiency and renewable energy will improve climate outcomes

#### Case study of energy efficiency subsidy swap: Mexico





Inefficient refrigerators + electricity subsidies 1.6 million refrigerators phased out via cheap loans + rebate 287 385 12, 309 **4** year 12 household tCO2e/year tCO2e / year new jobs million USD payback created refrigerant subsidy cost avoided **3.4** year avoided **CO**<sub>2</sub> gases removed government payback







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## Previous trends in reduction of fossil fuel subsidies



Factors to the change in the value of fossil-fuel subsidies in Southeast Asia, 2010 – 2015



Southeast Asia managed to reduce subsidies. Though a big chunk is aided by lower fuel prices, pricing reforms also helped. But more needs to be done to develop sustainably

#### Subsidy reform was informed by impact analysis

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	Impact				
Tariff reform option	Aggregate subsidy	Mean tariff	Tariffs for low deciles	Tariffs for middle deciles	Tariffs for upper deciles
Instant liberalisation	<b>444</b>	ተተተተ	+/-	ተተተ	ተተተ
Two-part tariff for all (MXN 52)	44	ተተ	+/-	ተተ	↑
Two-part tariff for all (MXN 20)	¥	<b>^</b>	+/-	♠	1
Two-part tariff – large consumers	¥	+/-	+/-	<b>^</b>	1
Summer month changes	¥	+/-	+/-	+/-	1

Impact analysis of electricity tariff structure reform in Mexico

#### Subsidy reform was informed by impact analysis

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	Impact				
Tariff reform option	Aggregate subsidy	Mean tariff	Tariffs for low deciles	Tariffs for middle deciles	Tariffs for upper deciles
Simplified tariff groups	¥	+/-	+/-	+/-	+/-
VDT	<b>****</b>	ተተተ	ተተተ	ተተተ	ተተተ
VDT with low consumption gratis	<b>111</b>	**	44	ተተተ	ተተተ
DAC to top 20%	***	1	+/-	+/-	ተተተ
DAC to top 50%	<b>111</b>	**	+/-	ተተተ	ተተተ

Impact analysis of electricity tariff structure reform in Mexico





#### Estimated percent reduction in CO<sub>2</sub> Emissions



Source: IMF Working Paper, 2015