

Reform of energy subsidies

The Asian experience

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Asia and the Pacific Policy Society Conference

Australian National University

Canberra, 11 March 2014

ADB

Outline of the presentation

1. Background
2. Objectives of the study
3. Analysis
4. Key results (preliminary)
5. Lessons

Background

- Fossil-fuel subsidies widespread in Asia
 - drag on economic growth
 - inefficient means of helping the poor
 - major cause of greenhouse gas emissions
- 2010: G-20 and APEC phase-out agreement
- Limited progress
 - concerns over the impacts
 - political economy issues
- Impacts depend on country circumstances

Background

- ADB study to examine fossil-fuel subsidies in
 - India
 - Indonesia
 - Thailand
- Countries represent a range of circumstances, subsidies and past reform approaches

Objectives of the study

1. Identify and quantify subsidies to fossil-fuels in each country (create an inventory of subsidies)
2. Estimate potential impacts of subsidy reform on:
 - a) Households and industry sectors
 - b) Energy system
 - c) GHG emissions and the macro-economy
3. Assess the need for and design of safety nets to protect the poor during reform

Inventory of subsidies

- Consumption of all fossil fuels and electricity in each country
 - Oil, coal and natural gas
 - Large majority of electricity in these countries is derived from fossil fuels
- One area of the upstream energy supply chain in each country
 - Coal (India)
 - Electricity (Indonesia)
 - Natural gas for vehicles (Thailand)

Inventory of subsidies

Subsidy definition based on the WTO's and includes:

1. Direct transfer of funds or liabilities
2. Revenue foregone or not collected
3. Provision by government of goods or services
4. Income or price support.

Must also be specific to a single/ group of enterprises or industries (or a particular fuel/ group of fuel products)

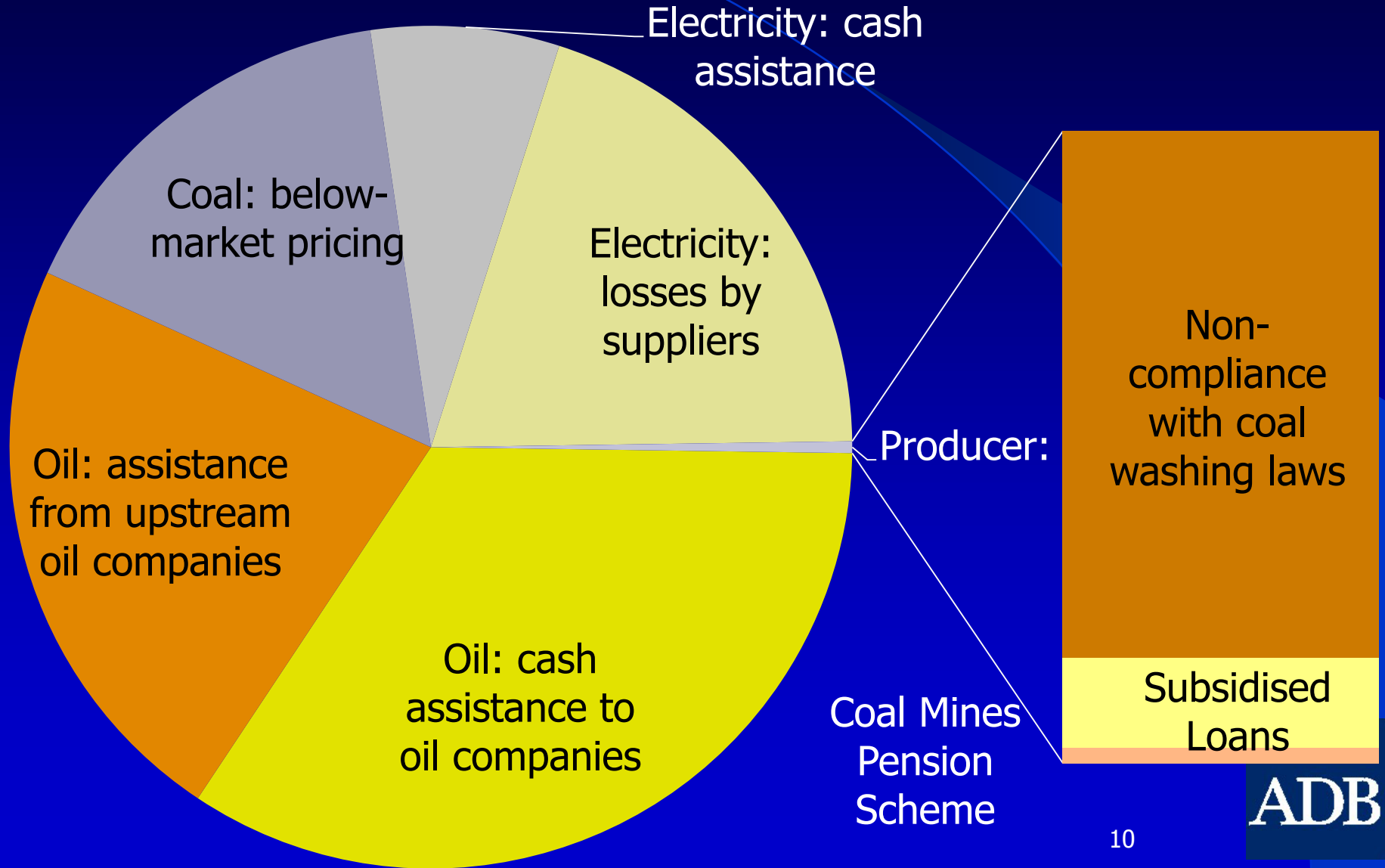
Inventory: what's included

National accounts and financial statements	ADB inventory = national accounts plus	Not in either
Direct spending	Opportunity costs	Subsidies that could not be quantified due to lack of data
Some tax and duty exemptions	Additional tax and duty exemptions	Externalities (e.g. cost of GHG emissions)
Losses from state-owned energy companies	Credit support	Optimal taxation
	Investment incentives	

Inventory: results (US\$ million)

Subsidy type	Energy type	India	Indonesia	Thailand
	Year	FY 2011-12	2012	2012
Consumer	Oil	27,923	24,595	6,077
	Natural Gas	85	374	714
	Coal	7,288	0	0
	Electricity	13,486	11,034	184
	Total consumer subsidies	48,782	36,002	6,975
Producer	Natural Gas for Vehicles	nq	nq	46
	Coal	208	nq	nq
	Electricity	nq	208	nq
	Producer subsidies as a % of total	0.4%	0.6%	0.7%
Total fossil-fuel subsidies		48,990	36,210	7,021
(% of GDP)		(2.6%)	(4.1%)	(1.9%)

India: largest subsidies



Indonesia: largest subsidies

Below-market pricing of LPG

Below market pricing of electricity

Below-market pricing of diesel

Below-market pricing of gasoline

Below-market pricing of kerosene

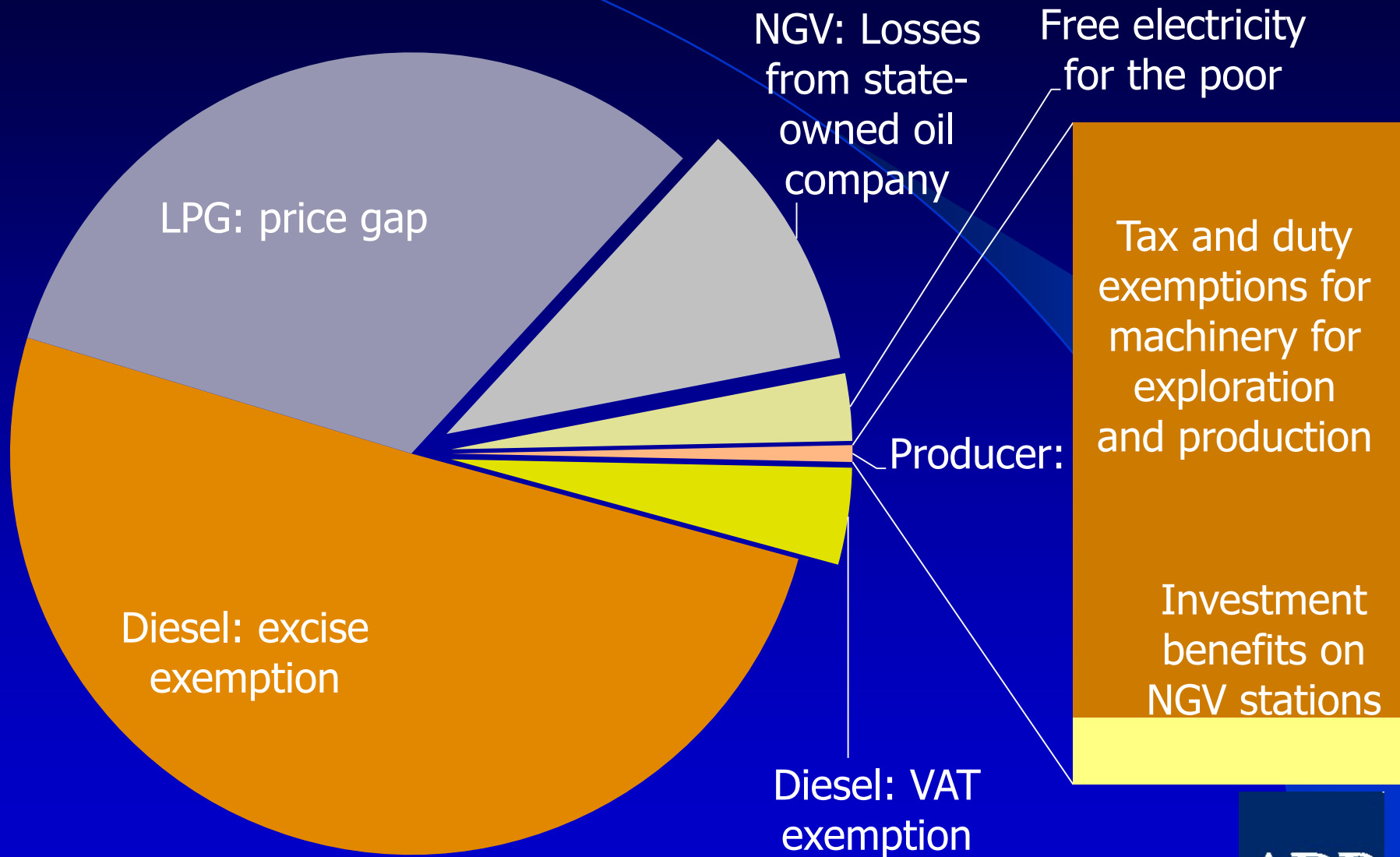
Producer:

Soft loans for PLN

Loan guarantees to PLN

Subsidized credit for PLN from Subsidiary Loan Agreements

Thailand: largest subsidies



Modelling

Area of interest	Model	Key results
Society and the economy	Social Accounting Matrix (SAM)	Short-term impacts on households and vulnerable sectors plus some macroeconomic indicators
Energy system	Market Allocation Model (MARKAL)	Medium and longer term trends for demand, supply and price
Macroeconomic	Energy-Environment-Economy (E3MG); Computable General Equilibrium (CGE)	Projections up to 2030 for GDP, inflation, production, investment and trade, GHG emissions

Scenarios

Subsidy removal

- i. Business as usual
- ii. Immediate elimination of all subsidies
- iii. Gradual removal (20% reduction each year over 5 years)

Reallocation of savings

1. None (subsidy savings pay down deficit)
2. Full compensation to all households (remainder to government)
3. Full compensation to bottom 40% (remainder to government)

SAM: preliminary results

Scenarios		GDP % change compared to BAU case
Immediate elimination	No reallocation (savings used to pay down government debt)	-2 to -13%
	Bottom 40% households fully compensated (reallocation of remaining savings to government spending)	+1.3% to +5%
20% reform	No reallocation (savings used to pay down government debt)	-0.4% to -1.5%
	Bottom 40% households fully compensated (reallocation of remaining savings to government spending)	+0.67% to +1%

MARKAL: Preliminary results

Country	Key fuels impacted	Impact on consumption	Fuel use to compensate
India	Coal and oil	-1%	n/a
Indonesia	Coal, natural gas and petroleum	-2% to -4%	Biomass (+9%)
Thailand	Natural gas and petroleum	-2.8% (gas) to -4.5% (petroleum)	Biomass (+4%) and Electricity (+14%)

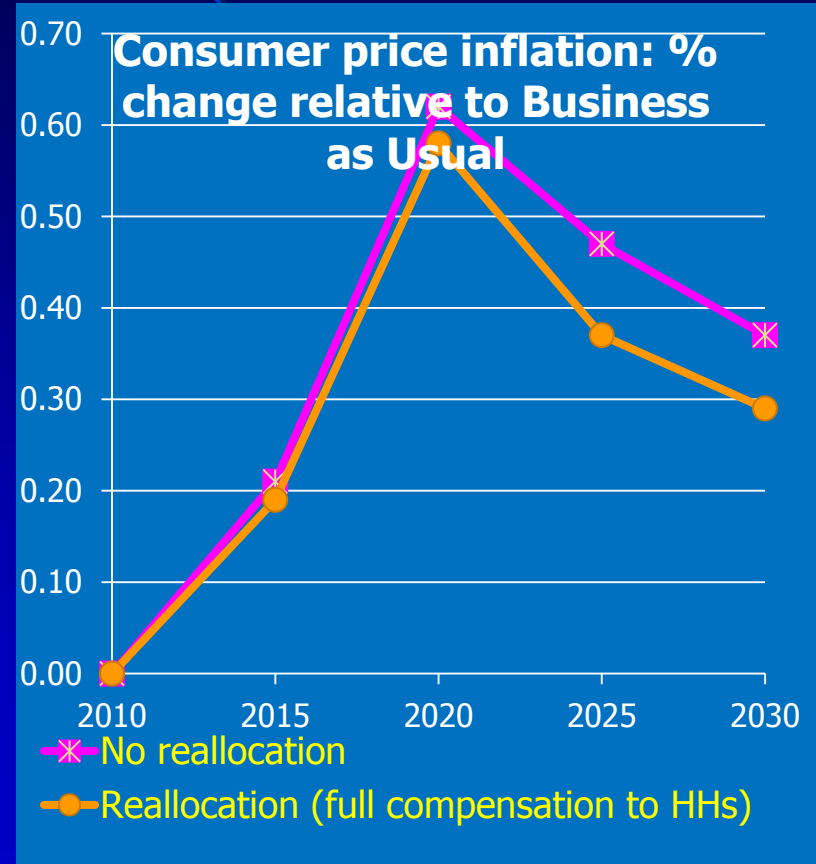
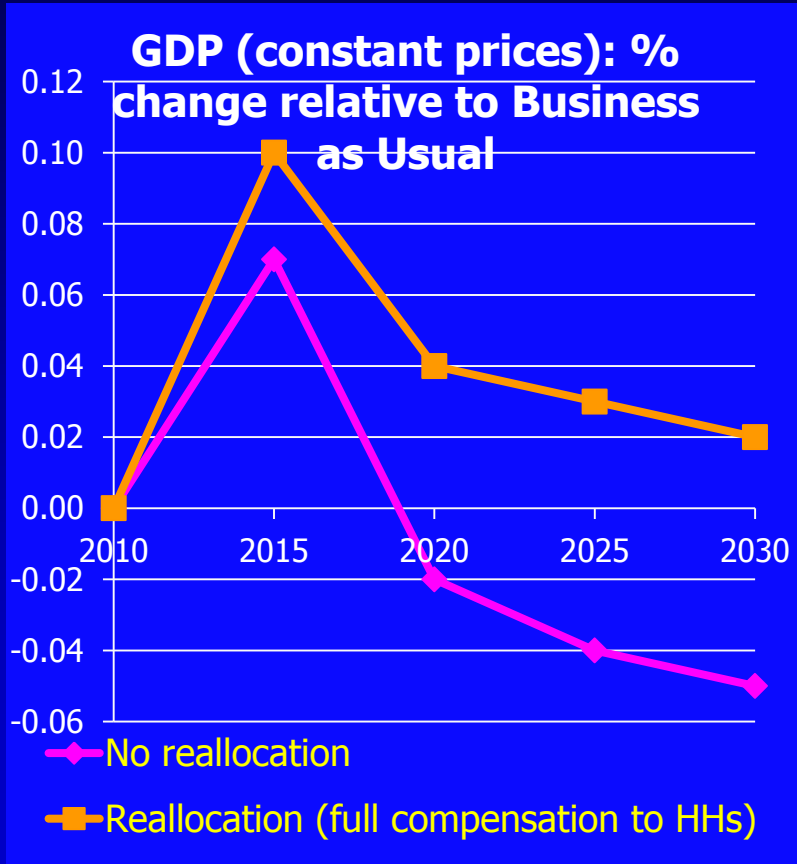
MARKAL: Preliminary results

- For all countries, most affected sectors:
 - Agriculture
 - Industry
 - Residential sector
- Transport also affected in Thailand
- Impact on transport limited in
 - India due to low demand elasticity
 - Indonesia due to fuel switching

Macroeconomic models

- Used to complement the SAMs and MARKAL
- E3MG (India and Indonesia) and CGE (Thailand) models show the overall long-term impacts
- Include a wider set of relationships in the economy
- Include two-way feedback between the economy and energy demand and supply

E3MG: Preliminary results (India)



E3MG: Preliminary results (India)...

- Smaller impacts than SAM: For 20% subsidy reduction
 - GDP changes $< 0.1\%$
 - Fossil fuel emissions decline over time
 - Energy intensive industries and energy sector negatively impacted by subsidy reform (others performed better)
- Reallocation of subsidy savings
 - offsets the negative impacts of subsidy removal
 - generates higher growth
 - neutralizes negative employment impacts
 - mitigates inflationary impact

Lessons

- Reallocation of subsidy expenditure shields the poor from higher energy prices
- More efficient use of public resources yields significantly more progressive and efficient social & economic outcomes
- **BUT ...**
- Fully compensating the bottom 40% is easier modeled than done
- Important to examine safety net policies and international best practices to effectively protect the poor during reforms

For More Information

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