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# **Acceptance and Environmental Impacts of Fossil Fuel Subsidy Reform**

## **A Case Study of the Indian Kerosene Subsidy**

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# 1. Fossil Fuel Subsidies

- Definition of Energy Subsidies by International Energy Agency:

*“[...] any government action that lowers the cost of energy production, raises the revenues of energy producers or lowers the price paid by energy consumers”*

- Fossil Fuel Subsidies particularly prevalent in low-income and emerging economies

Two-fold energy challenge

- Provide population with basic modern energy services
- Reduce large greenhouse gas emissions to participate in a global transition to low-carbon energy systems



# 1. Fossil Fuel Subsidies

## Legitimate purposes of fossil fuel subsidies

- Access to energy for poor
- Industrial policy (cheap energy for production)
- Support energy supply
- Fuel-switch (support cleaner fuels like LPG)

## The Downsides

- Distortion of resource allocation
- High fiscal cost
- Fail as social policy (there are better and less costly instruments)



# 1. Fossil Fuel Subsidies: Environmental benefits of reform

- Evidence from general-equilibrium models: GHG emissions would be reduced significantly in the longer term if subsidies were abolished (Burniaux and Château 2011; IEA et al. 2010; Coady et al. 2015; IEA 2014).

-> How do individual fuel consumption patterns change as a response to fuel price increases?



# 1. Fossil Fuel Subsidies: Barriers to Reform

- Considerable efforts by international organizations and donor countries to reduce subsidies on fossil fuels
- Reforms are most often politically contentious
- Actual progress on reform has been very slow
- Importance of political factors, e.g. institutional weakness
- Generally low public support for reforms
- Unresolved questions remain

-> More evidence needed needed to understand which factors enhance or diminish public support for subsidy reform



AFP/GETT



## 2. Overall research goals

- Focus on reform options involving a replacement of direct fuel subsidization by cash-transfers
- **Case study on Indian kerosene subsidy**

-> Institutional perspective:

How does acceptance in the population depend on the concrete modalities of implementation?

-> Environmental perspective:

Under which conditions can a fuel pricing reform actually be expected to lead to reduced emissions as a result of decreased fuel consumption?





### 3. Context: Indian fuel subsidy policy and –reform

- 2004 and later: Diesel, LPG and kerosene heavily subsidized
- FY 2011/12: Rising domestic consumption & currency depreciation, constantly high oil prices -> oil import bill significantly increased -> high trade and current account deficit, high fiscal burden
- FY 2013/14: expert committees -> Decontrol of diesel prices
- LPG and kerosene remain centrally administered and subsidized
- LPG subsidies replaced by bank transfers = Direct Benefit Transfer (DBT)
- **Similar system planned to be rolled-out for kerosene.** Currently sold at subsidized rates to poor households through Public Distribution System (PDS)
- Politically sensitive. Primary goal: reduce leakages / improve targeting





## 4. Research design: Choice between a subsidy and a cash transfer using PDS kerosene

**Prior studies on Indian PDS System vs. Cash-transfers** (Khera 2014, TERI and IISD 2014)

- Preference for existing system of subsidized goods. Many factors; Banking procedures, mistrust, advantages of PDS,...
- Important argument: Transfer modalities (Bank transfer)

**Behavioural economics and experimental economics literature** (Branas-Garza and Cabrales 2015):

- Relevance of time discounting and risk attitudes for peoples' economic choices



## Selected drivers of public response to direct cash benefits as a replacement for the subsidized Kerosene

Bank:	<ul style="list-style-type: none"><li>Distance to bank</li><li>Lack of confidence with banking procedures</li><li>Uncertainty related to disbursement by bank (trust &amp; risk aversion / fear of hassling)</li></ul>
Time preferences:	Preference to receive transfer immediately
General uncertainty:	Uncertainty regarding receipt of transfer (mistrust vs. public officials in addition to mistrust against bank staff)
Cash:	<ul style="list-style-type: none"><li>Fear of inflation (and of corruption)</li><li>Fear that cash will be dissipated (spending on non-essential goods)</li><li>Distance to market &amp; development of market (availability of fuels)</li><li>Visibility of cash transfer (can affect social dynamics within &amp; between households)</li></ul>



## 4. Research Design: Research Questions

Particular focus on:

*What is the valuation of PDS-kerosene compared to a cash transfer (direct benefit transfer), under different conditions, i.e. transfer modalities?*

*What is the beneficiaries' individual time discounting? Can the apparent „cash-aversion” be explained by the time preferences of individuals?*

*How risk-averse are individuals? Is there a relationship between risk attitude and stated uncertainty to receive the DBT transfer?*



## Research design: Empirical strategy

Survey amongst approx. 300 current PDS-beneficiaries

- **Part I: Semi structured questionnaire**
  - Fuel consumption patterns
  - Knowledge & opinion on PDS system & reform plans
  - Individual preferences & arguments w.r.t. PDS vs. cash transfers
- **Part II: Experimentally validated measurement of risk attitudes and time-preferences**
- **Part III: Experimentally validated measurement of subsidy valuation compared to different alternatives**



## Subsidy valuation using experimental instrument

- How costly do people find it to give a certain amount the kerosene subsidy away?
  - = Minimum threshold at which beneficiaries would be willing to forgo their current ration of PDS kerosene in favour of a cash transfer?
  - > Experimental task: Offer increasing amounts of money as replacement
- Does the threshold vary under different conditions? Randomized variation between and within subjects
  - > Offer money in form of
    - hard cash vs. bank transfer
    - tomorrow vs. 1 month
    - bank officer or person of trust

*Issue to address: How to incentivize this part of the study?  
Cooperation of state officials, PDS-shops, banks required....*



## 5. Implementation: selecting the location

- Low acceptance of cash transfers as a substitute for PDS subsidies (Khera 2014)
- States with roll-out planned in the near future
- Relevance of kerosene /firewood/dung/coal consumption
- Concentration of major kerosene consuming households
- (Hindi)





Provisional location selection criteria

High Preference for PDS (Khera 2014)			Piloting States DBT	Kerosene usage (% of individuals)			Major kerosene consuming states (rural or urban HH)	
Andhra Pradesh	Chittoor Warangal	91.3	Chhattisgarh	Himachal Pradesh	Mandi	0.14	Bihar	(rural)
Chhattisgarh,	Mahasamund Surguja	90.3	Haryana	Himachal Pradesh	Sirmaur	0.07	Jharkand	(rural)
Himachal Pradesh	Mandhi Sirmaur	81.4	Himachal Pradesh	Rajasthan	Bharatpur	0.94	Madhya Pradesh	(rural)
Jharkhand	Dumka Ranchi	66	Jharkhand (all districts!)	Rajasthan	Pali	0.84	Uttar Pradesh	(rural)
Odisha	Nuapada Sundergarh	88.3	Madhya Pradesh	Jharkhand	Ranchi	0.95	West Bengal	(rural & urban)
Rajastan	Bharatpur Pali	59.6	Maharashtra	Chhattisgarh	Sarguja	0.47	Maharashtra	(urban)
Tamil Nadu	Dharmapuri Dindigul	70.6	Punjab	Chhattisgarh	Mahasamund	0.95	Gujarat	(urban)
			Rajastan	Andhra Pradesh	Chittoor	0.69	Uttar Pradesh	(urban)



## 5. Implementation: provisional timeframe

When	Activity	Details
July '16	Project start	Base Project Funding
Sept '16	<b>Preparation Field study</b> Short visit IEG Delhi	Expert Interviews Preparation of field study
Nov '16	Pre-test of survey modules	Pre-testing & adjustment
<b>Jan &amp; Feb 17</b>	<b>1. Field research India</b> approx. 300 participants, 2 districts in Non-piloting states	- Basic Questionnaire - Special experimentally validated survey modules on risk aversion, time preferences and valuation of PDS subsidy vs. cash
Spring 17	<b>Visit Indian participants in Switzerland</b> Desk studies Data analysis (& Preparation)	Statistical analysis of experimental data, Development of more specific hypotheses w.r.t. environmental effects of DBT, Preparation of large survey-study
Approx. August & Sept. 17	<b>2. Field research</b> Conditional on 3rd party funding, >1000 participants	2 Surveys pre- and post DBT introduction: attitudes towards DBT scheme, fuel consumption, conditions leading to fuel consumption reduction. Suppressed demand issues.



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