Low Carbon Development Options

Indonesia Country Study

August 28, 2009

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Indonesia: Climate Change Accomplishments

- Rationalizing energy pricing and reducing deforestation; putting stronger programs in place for the future
- Developed tax break system and soft loans to encourage adoption of pollution control technology
- In May 2008, reduced fuel subsidies, thus increasing incentives to conserve fuel and reduce emissions.
- In June 2008, published blueprint for integrating climate change into national development planning and budgeting process.
- In July 2008, established National Council on Climate Change as a center for policy coordination
- Included climate change in annual work plan, budget notes and medium term development plan

Why Development with Low Carbon?

Promote Sustainable Development

- Reducing emissions can provide financing for alt development paths
- Co-benefits for health, congestion, forest environmental services

Prepare for Future

- Competitiveness: Energy efficiency for cleaner, cheaper production
- Int'l markets: Keep & gain markets by reducing deforestation
- Energy security: Reduce fuel imports; develop own resources

Access Financing, Potentially $ Billion/yr

- Climate Investment Funds: low cost finance for transformation
- Carbon markets: REDD/Forest Carbon = high potential
- Investment Climate: Stimulate private sector role to greener path

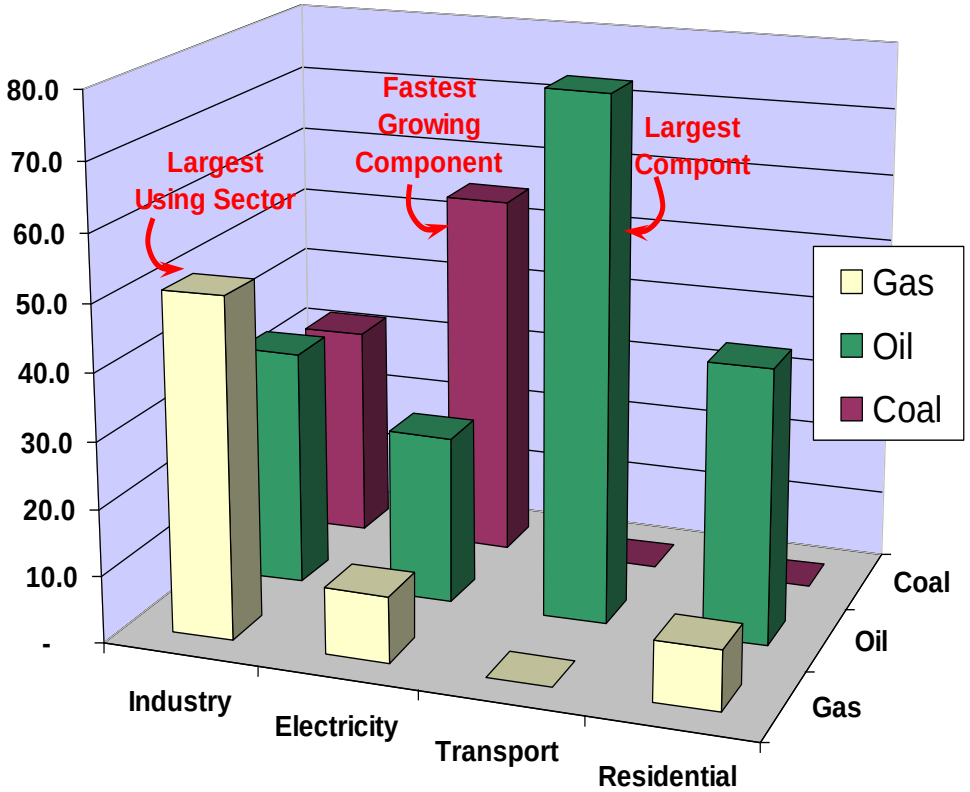
Develop Indonesia's Own Low Carbon Alternatives

- Vast renewable energy resources: geothermal, hydro, biomass
- Low/no cost alternatives in gas flaring, transport, energy efficiency

Indonesia's Emissions Profile: Fossil Fuels, Sources, Sectors: Looking Ahead

- **Emissions growth > Energy growth > GDP growth**
- **Emissions will double every 12 years: 4x by 2030**
- **Coal = major power source: increasing carbon intensity**
- **Overall and per capita emissions are low (from fossil fuels)**

ID: Emissions by Fossil Fuel and Using Sector
(Source: IEA 2004 in MtCO2e)



Industry = largest emitter

- Inefficient fuel use
- Subsidized energy prices

Power = fastest growing

- Shift to coal in "10,000 MW"

Transport = Largest fuel user

- Fast growing; Mainly vehicles

Residential

- Potential future growth

Key Findings on Fossil Fuels: No Regrets?

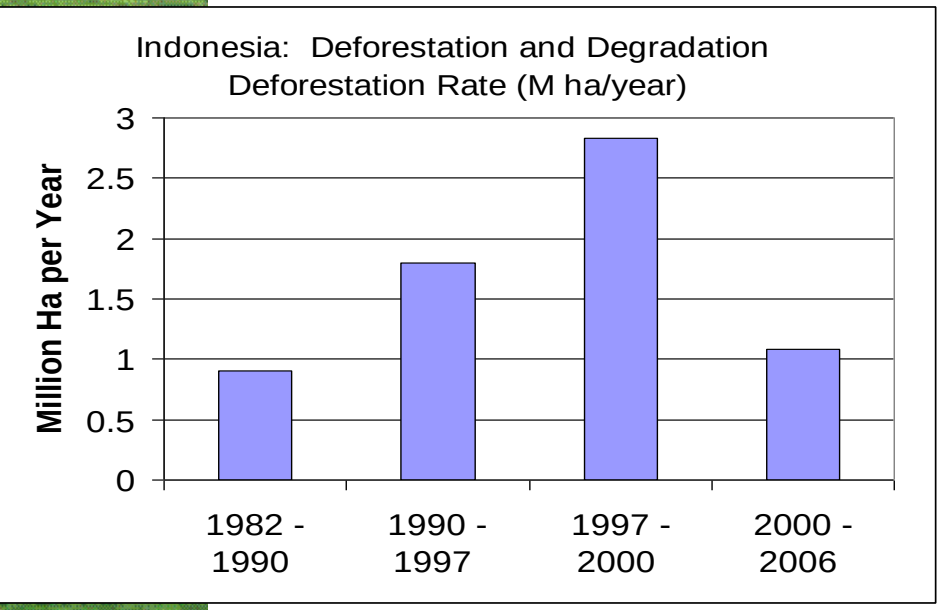
Fossil Fuel/Energy Issues: Well Understood

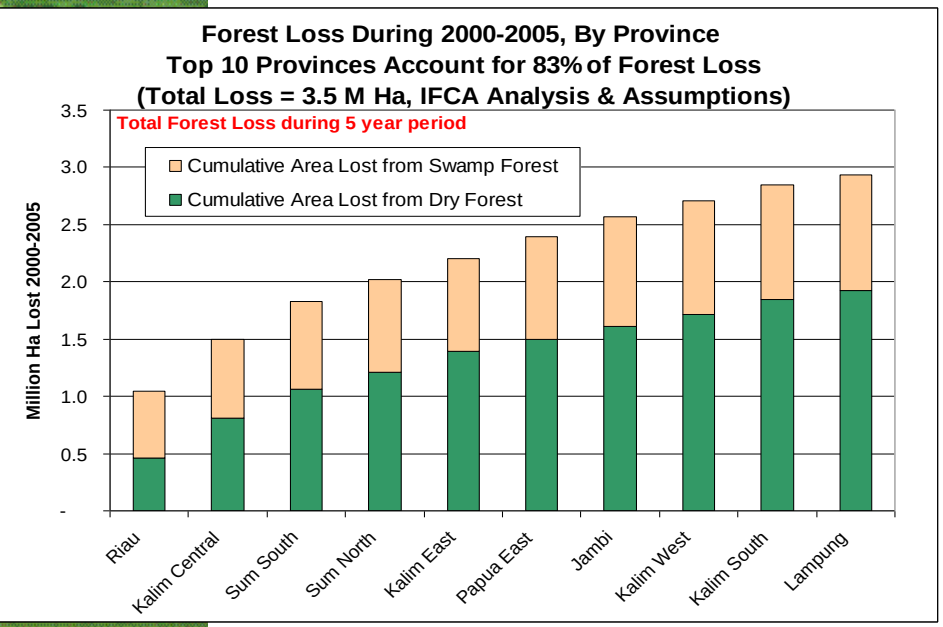
- Low Carbon add new lens, but not different fundamental options
- Climate Change offers incentives to improve, plus political will

Policy Options Debated Before "Low Carbon"

- Energy Price Subsidies: Large budgetary implications; Impacts on competitiveness & efficiency
- Investment Climate: Incentives for new energy investment, energy efficiency, renewables are distorted due to pricing issues
- Energy Waste / Emissions: Some options are low cost/no cost: energy efficiency, gas flaring, renewable energy development
- Transport: Fuel quality & vehicle emissions standards; Many countries have adopted for health, local air pollution reasons

Indonesia's Emissions Profile: Forestry and Land Use, Looking Forward





- **High deforestation, illegal logging, forest fires, peat loss**
- **Emissions = high, but uncertain (fires, peat, degradation rates)**
- **Recently: Deforest rate has declined**

Greatest areas of concern:

- **10 Prov > 78% Forest & Peat Loss**
- **Sumatra & Kalimantan, Papua next**
- **Economic use of forest & swamps**
- **Conversion for plantations + FIRE**
- **Peat drainage = long term problem**

REDD = Opportunity & Incentive

- **Indo: Int'l negotiations, FCPF & FIP**
- **Potential ~ $ Billion could be gained**
- **Needs ++performance & governance**
- **Good donor engagement & financing**

Key Findings on Forestry: No Regrets?

Forestry Issues: Long Analyzed, Well Understood

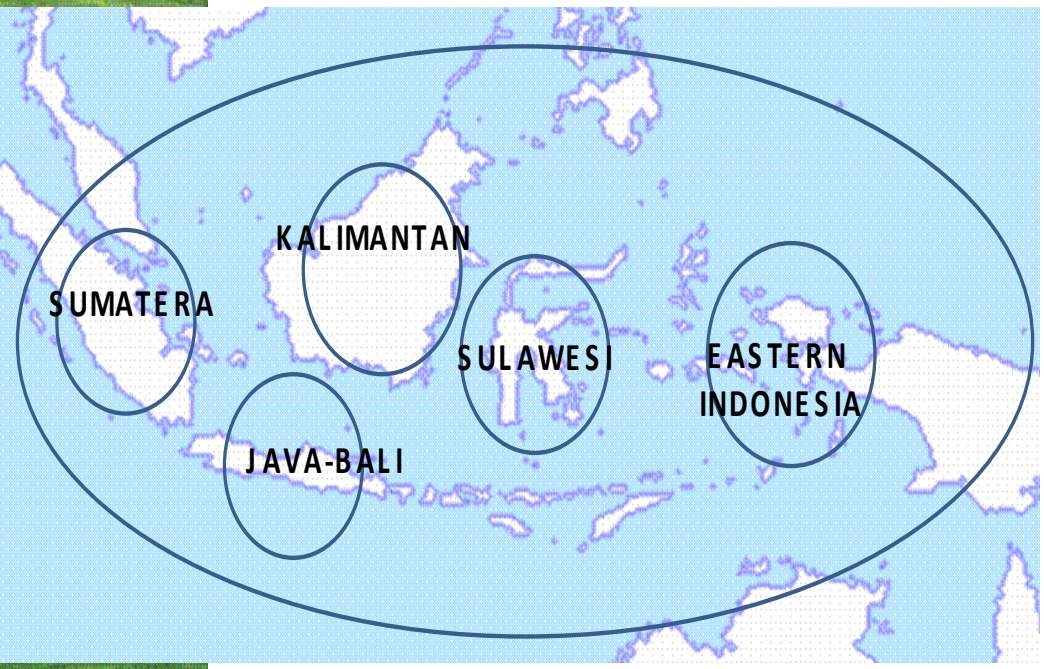
- Forest carbon mkts (REDD) offer new $ incentives for improvement
- But, no magic bullet: Payment is based on performance

Policy Options Debated Before "REDD" / Climate Change

- Improved forest law enforcement, management & governance (also fundamental for any REDD scheme)
- Realigned incentives for timber harvesting and processing firms, to improve competitiveness & economic returns
- Forest & land fire control: Smoke and haze cause high health costs, transboundary issues, loss of assets
- Equity & transparency in forest/land use decisions (also fundamental for any financing and distribution mechanism)
- Independent monitors of legal compliance, participation

Low Carbon: Economic Impact Analysis Framework

"Inter-Regional System of Analysis" - IRSA-INDONESIA-5 CGE Model



- Bottom up Inter-Regional CGE, based on IRSAM - 2005 GOI I-O table
- Models trade, factor flows, gov't transfers
- Income distrib: Top-down exp based (100 rural & urban classes/region)
- Carbon emissions: fossil-based consumption only
- Dynamic to 2050; based on,
- CSIRO/ANU w/ Bappenas, AUSAID

Policy Scenarios for Simulation

- **REDD:** Reduce deforestation rate
- **GHG Emissions:** C tax w redistrib
- **Fuel price rise:** W redistrib/ compensation
- **Energy efficiency:** Industry/sector targets/policies

Indicators available: Poverty, Growth, GHGs, GOI revenue, 35 sectors, gains & losses, but not deforestation

Economic Scenario Analysis: Some Preliminary, Interesting Results

REDD/Forestry

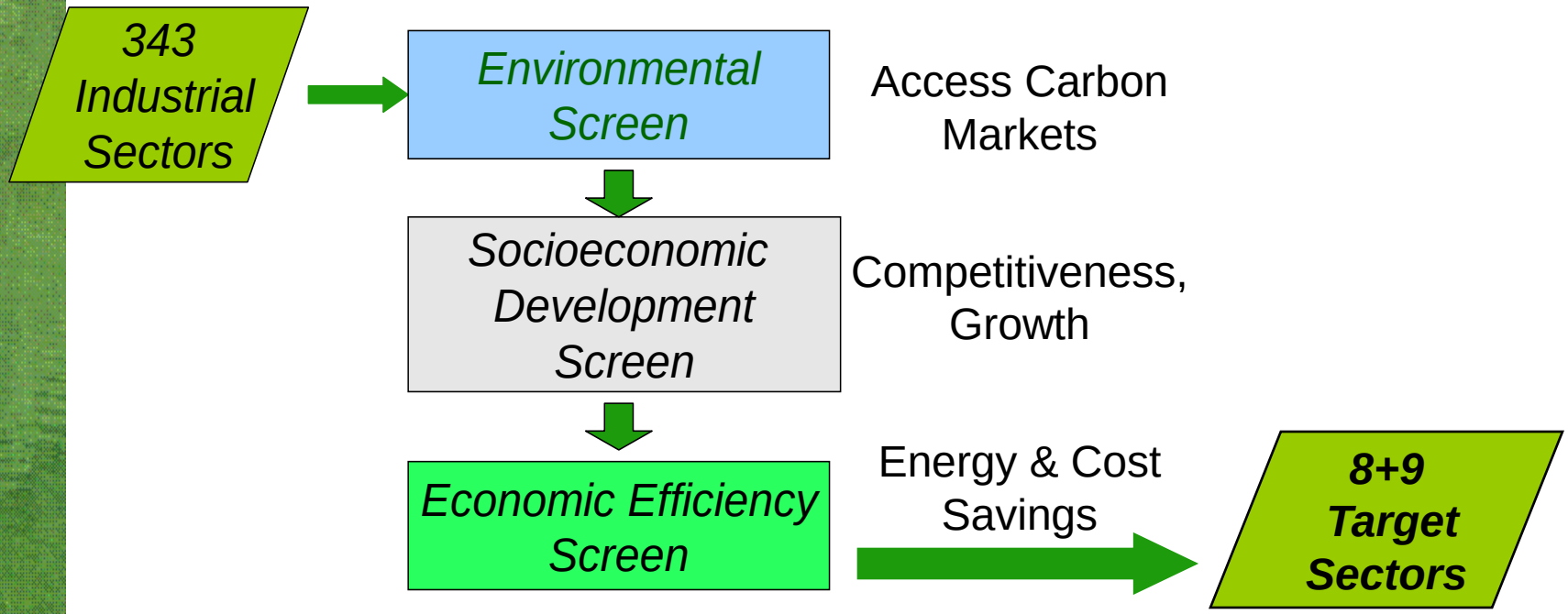
- Reducing deforestation off Java, reduces forest products, affects econ activity on Java
- Without targeted transfers … forest-rich regions gain, forest-poor regions may lose; … rural areas gain much more than urban
- REDD payment distribution mechanism matters: households consume, governments invest in infrastructure and growth

Energy/Fossil Fuels

- Carbon Tax: Raises fuel prices, restructures economy; But revenues raised can be redirected to mitigate downside
- Fuel Price Increase (subsidy down): Affects middle class more than poor (use less energy); Compensation through cash transfer helps

Manufacturing Sector Emissions Targets for Reductions, Energy Efficiency

3 - tier screening: Seeking carbon targets that make sense from environment, econ development, & financial point of view



Specific policies can be targeted to different sectors

- **Regulatory approaches:** Efficiency standards, best practices
- **Fiscal measures:** Subsidy/tax incentives, investment climate
- **Legal and labeling:** Env reporting, stimulate carbon markets
- **Voluntary:** Education/ awareness of win-win choices

Manufacturing: 3 Tier Screening Summary

Screening Criteria:

Environmental

- GHG Emissions
- Natural Gas Use

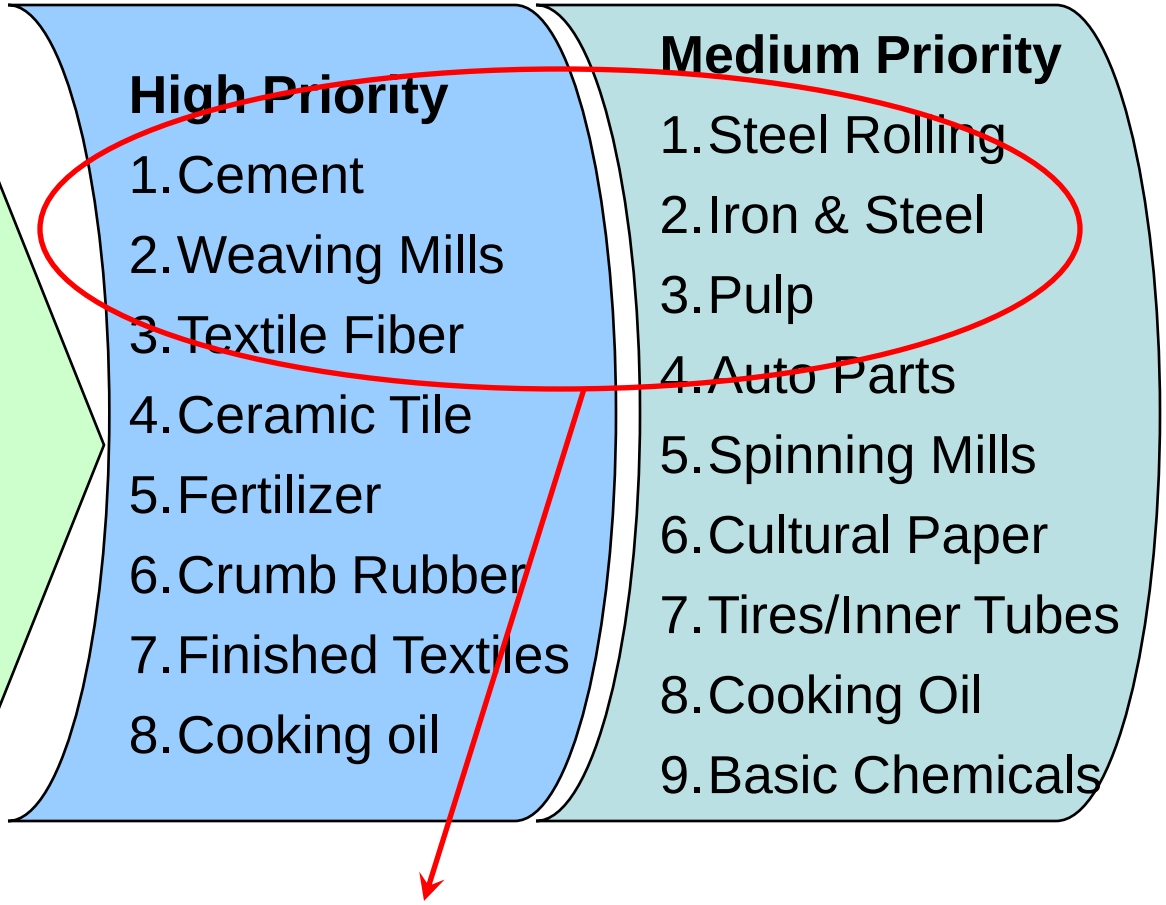
Econ Development

- GDP & Growth
- Output Multiplier
- Linkage Index

Energy Efficiency

- Energy Opportunity
- Improvement Capacity
- High energy costs

Industry Targets for Policy/Action



Already priority targets of Ministry of Industry
Opportunity for integrated policies & investments

Key Policy Approaches for Targeting Emissions in Manufacturing

Approach	Target	MOF Entry Point
• Technology Investmt • (MOI/GOI plans)	• Heavy Industry • Large Firms	• Tax deductions • Carbon Mkt (CDM) • Depreciation Incentive
• Energy Efficiency Deployment • Establish EE Targets	• Med. Industry • Energy Service Cos	• Tax breaks for ESCOs • Soft loans for Energy Efficiency
• Minimum Efficiency Standards • Common equipment	• Refrigeration, lights, motors • SMEs also	• Grant program for key technologies • Tax incentives for high efficiency purchases

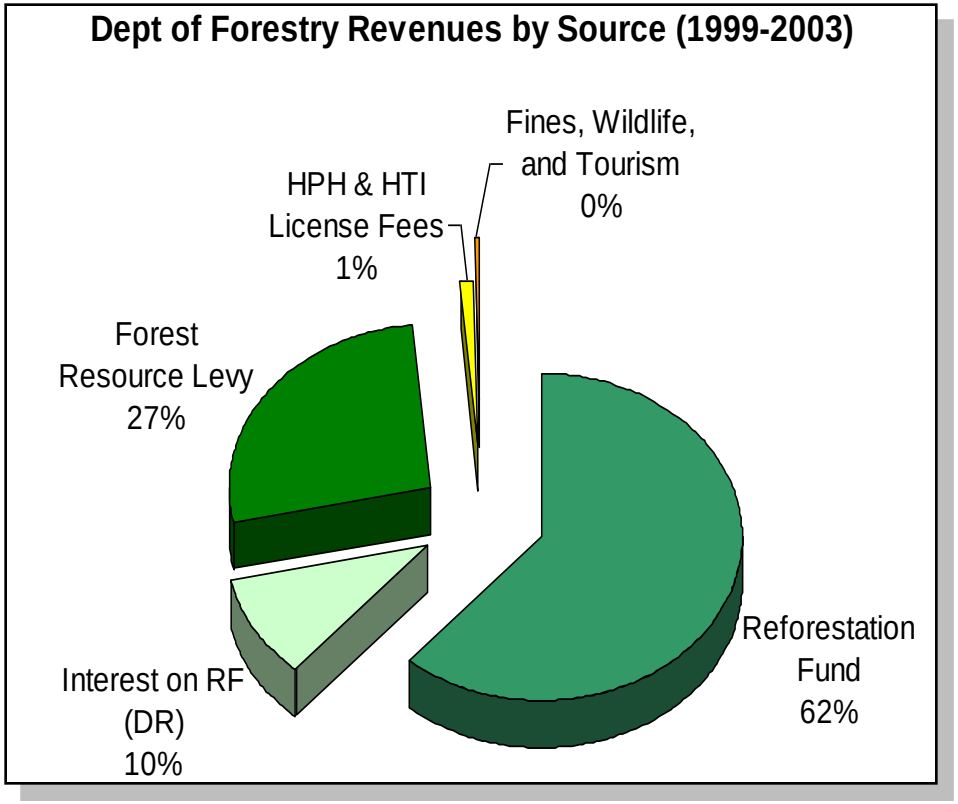
Forestry Sector & REDD: Analysis of Fiscal Contributions & Policy Options

Large contributor to economy, jobs

- GDP: Rp 91.2 tr or 3.3% (2005)
- Forex: US$ 6.18 bn or 6.1% (2006)
- GOI Rev.: Rp 2.40 tn or 0.4% (‘06)

Env services with economic value

- Direct: water supply, soil fertility, pest control, local livelihoods
- Indirect: watershed & biodiversity protection, carbon sequestration



REDD = New incentive, opportunity

- Potential revenue depends on areas Involved, ~= econ contribution
- 0.5 M ha: $200 – $1,200 million/yr (compare GOI tax revenue)
- 1.0 M ha: $400 – $2,400 million/yr (compare other sectors)

Fiscal Management Matters for Forest Management

Forest Fiscal Policies: Current Status

- Inefficient fiscal mechanisms, low recovery, poor incentives
- Losses of tax and non-tax revenue through illegal logging
- Under-reporting of harvest and tax / non-tax obligations
- Royalties on legal timber are below economically efficient level

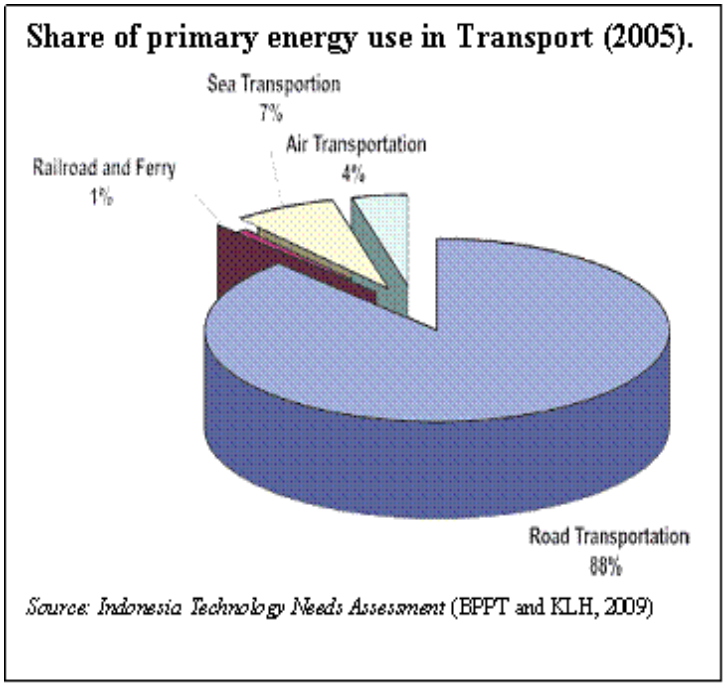
Forest Fiscal Policies: Highly Relevant to REDD Discussion

- Incentives can improve forest mgmt, decrease deforestation
- REDD offers potential for payments for emission reductions
- Carbon market payments/compensation: needs careful design

- ➢ Need study of opportunities for improving mgmt, increasing revenue, efficiency, sustainability; benefits from forest C mkts
- ➢ Need targeted incentive improvements for success of REDD
- ➢ Australia, UK and other donors are assisting

Transport Sector: Overall Emissions & Assessment

- Transport = 23% of GHG fossil emissions
- Road transport (cars, trucks, motorcycles) = 88 percent of this
- Transport is the largest user of liquid fuel: Bensin and Diesel
- Emissions are projected to double within 10 years: addition of cars and trucks
- Motorcycles = largest numbers, but cars & trucks cause most emissions (and growth will increase the gap)



Many co-benefits of addressing transport issues:

- Reduced congestion and associated time and productivity losses
- Reduced dependence on imported fuels: Energy security
- More convenient and efficient public transit options
- Home-grown successes: Transjakarta Busway
- Neighboring countries provide examples of cost effective reforms

Elements of an Integrated Transportation Approach

Strategy	Measure	Cost-Benefit Considerations
1. Improvements in emissions standards (Vehicle Technology)	Improvement and enforcement of emissions standards on new and imported vehicles	- No added cost to GOI - Costs passed on to owners - Reduced air pollution & GHGs from new and existing vehicles
	Improvement and enforcement of in-use vehicle emissions standards	
2. Improved inspection and maintenance	Enforcement of routine emission inspection as part of road-worthiness program	- Costs passed on to owners - Reduced emissions only if effectively enforced
3. Cleaner fuels Improvements in fuel standards and quality	Improvements in fuel standards and quality	- Investment is high, but benefits > costs - Needed to allow fuel-efficient technologies to enter market
	Use of alternative fuels (CNG and biofuels)	- Cost is high (esp for biofuels) - May need econ incentives
4. Improved transport planning and traffic demand management	Land use and transport planning Travel demand management Public mass transport options Non-motorized transport	- Requires tax incentives, subsidies, pricing - Co-benefits in urban transport mgmt urban environment

Basic steps to future improvements & integrated strategy:
tighter standards, Fiscal incentives, technological improvements, modal shift

Low Carbon Opportunities for Indonesia

- Better mgmt for forestry sector: improved incentives, revenue, asset values
- Leverage investment in energy infrastructure
- Avoid long-term liability of high-C infrastructure
- Econ stimulus for “green recovery”
- International climate finance toward lower carbon development pathway