

Options to Reduce GHG Emissions through National Appropriate Mitigation

Beijing, China

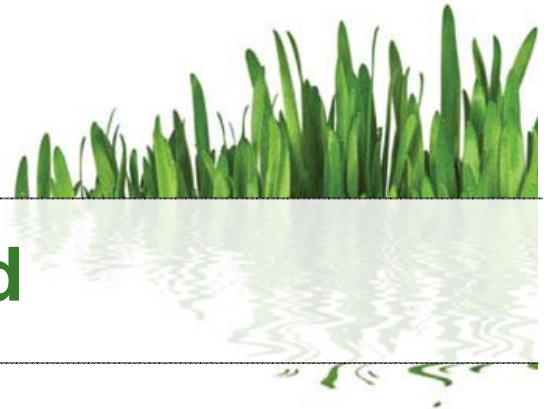
13 May 2009



Development of bio-fuels and electric vehicles in Indian transport sector

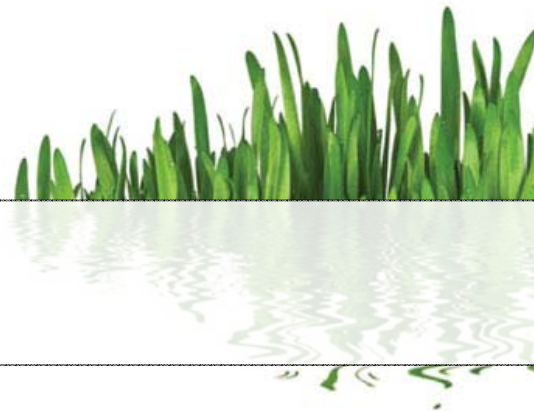
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India Transport Sector: Background

- March 2009, 109 million registered vehicles
 - 13% commercial, 13% passenger, 74% two-wheelers
- Vehicle production rapidly growing
 - Rose 85% to 105 million between 1994 - 2004
- Indian CO₂ emissions from transportation represents approximately 10% of country's emissions ~ 150 mt
 - One of the fastest growing emission sectors
 - IEA projects emissions to grow 92% between 2002 and 2020
- Face of Indian urban transport changing
 - Demand for bigger cars
 - Increased interest in fuel efficiency



India's NANO



Delhi

Standard ~ \$ 2,500

Nano CX SP ~ \$ 3,000

Nano CX MP ~ \$ 3,000

Nano LX ~ \$ 3,500

Nano Price				
	Nano Standard - Non-AC (BS-III)	Nano CX - Solid Paint/AC (BS-III)	Nano CX - Metallic Paint/AC (BS-III)	Nano LX - Metallic Paint/AC (BS-III)
Delhi	Rs.123,360	Rs.148,360	Rs.151,360	Rs.172,360
Mumbai	Rs.134,250	Rs.160,320	Rs.163,320	Rs.185,375



Mitigation Option: Electric Vehicles (EV)

Increasing EVs in Urban Transportation Fleet

- Government started promoting EVs in 1997
- Electricity has smallest share in Indian urban transportation
 - 25% of total route kilometers electrified
 - Negligible share on road
 - 130,000 EVs vs. 98 million petrol and diesel vehicles sold in 2008
- Categories:
 - Hybrids
 - Battery operated vehicles (BOVs)
- Domestic manufacturers' portfolio has small sized EVs only
- Not practiced in mass transits except for trams and metros



Barriers to adoption of mitigation options

■ Technological barriers

- Limited distance
- Limited weight carrying ability
- Charging infrastructure

■ High upfront costs

■ Battery supply and maintenance support

■ Lack of institutional support

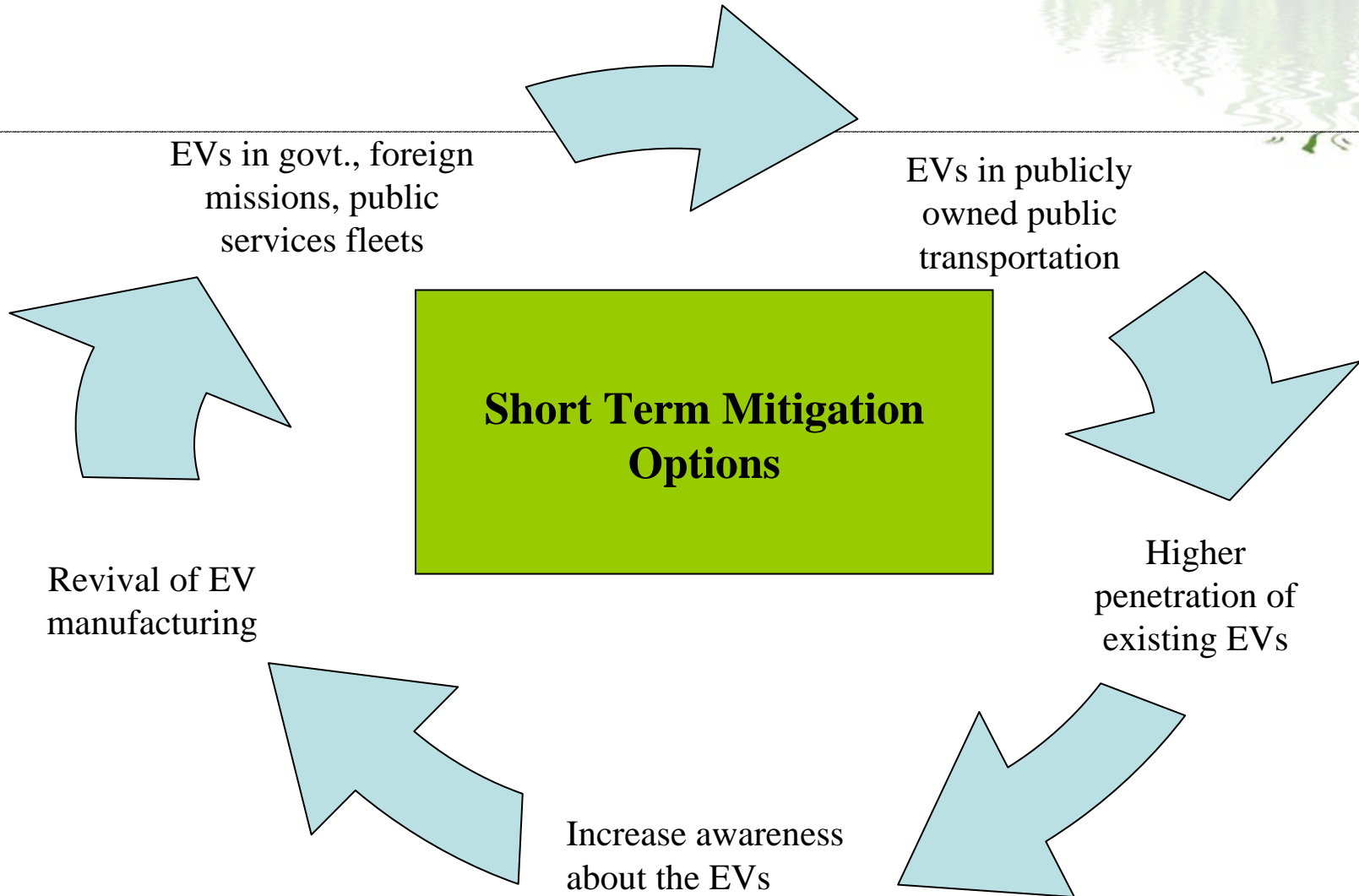
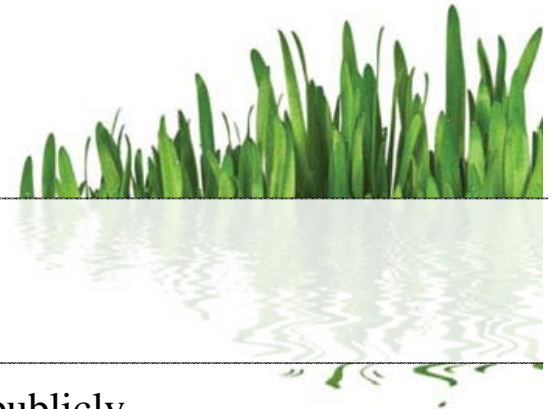
■ Existing schemes and incentives are in place

- Initial central scheme for select consumers in 1997 but withdrawn the next year

■ Battery operated vehicle scheme 2006 by Ministry of New and Renewable Energy

■ Several initiatives by local governments

- Delhi, Chandigarh, Bangalore





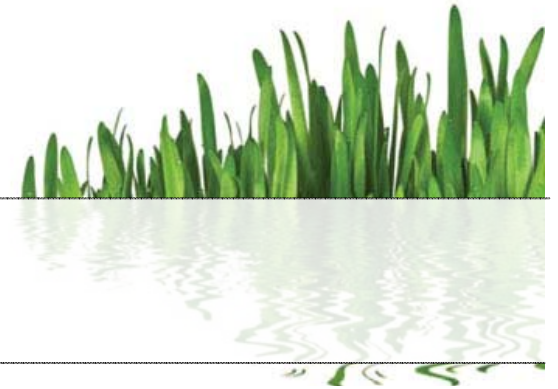
Mitigation Policy Options

■ Short - Medium Term

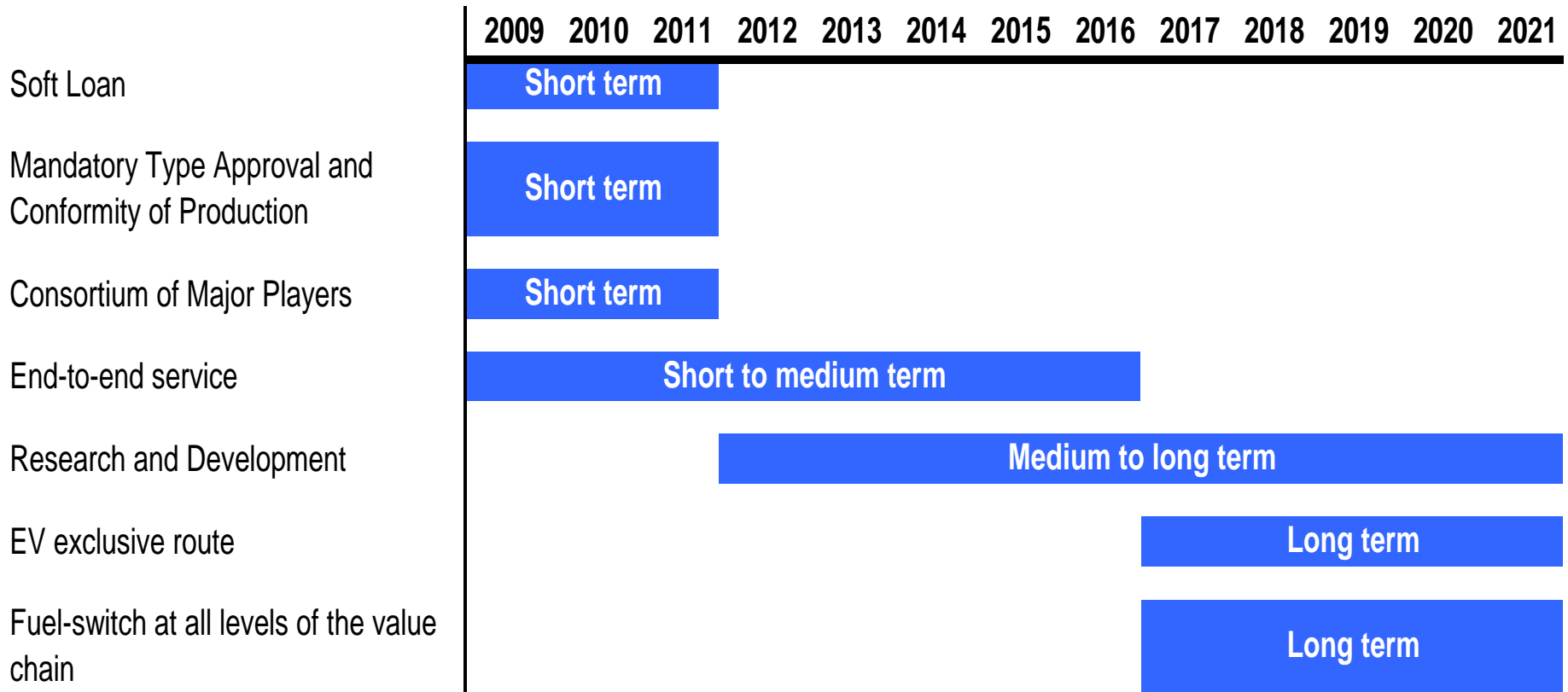
- Fiscal incentives for manufacturers, corporate fleet, individual buyers
- Support infrastructure
- Subsidies, preferential parking
- Consortium of major players
- Mandatory Type Approval

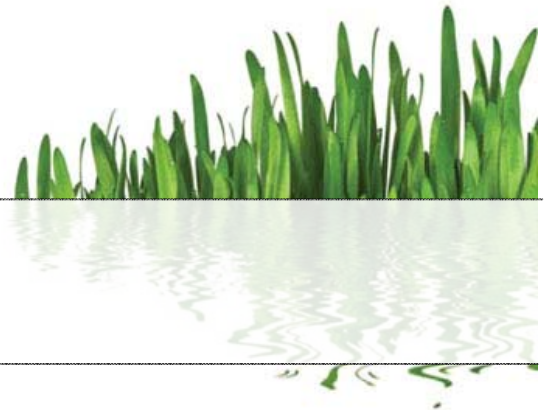
■ Long Term

- R&D for longer battery life and efficiency
- Accommodating higher carrying capacity and higher speed
- Exclusive routes
- Increasing proportion of metros and trams
- Increased fuel switch flexibility



Policy Options





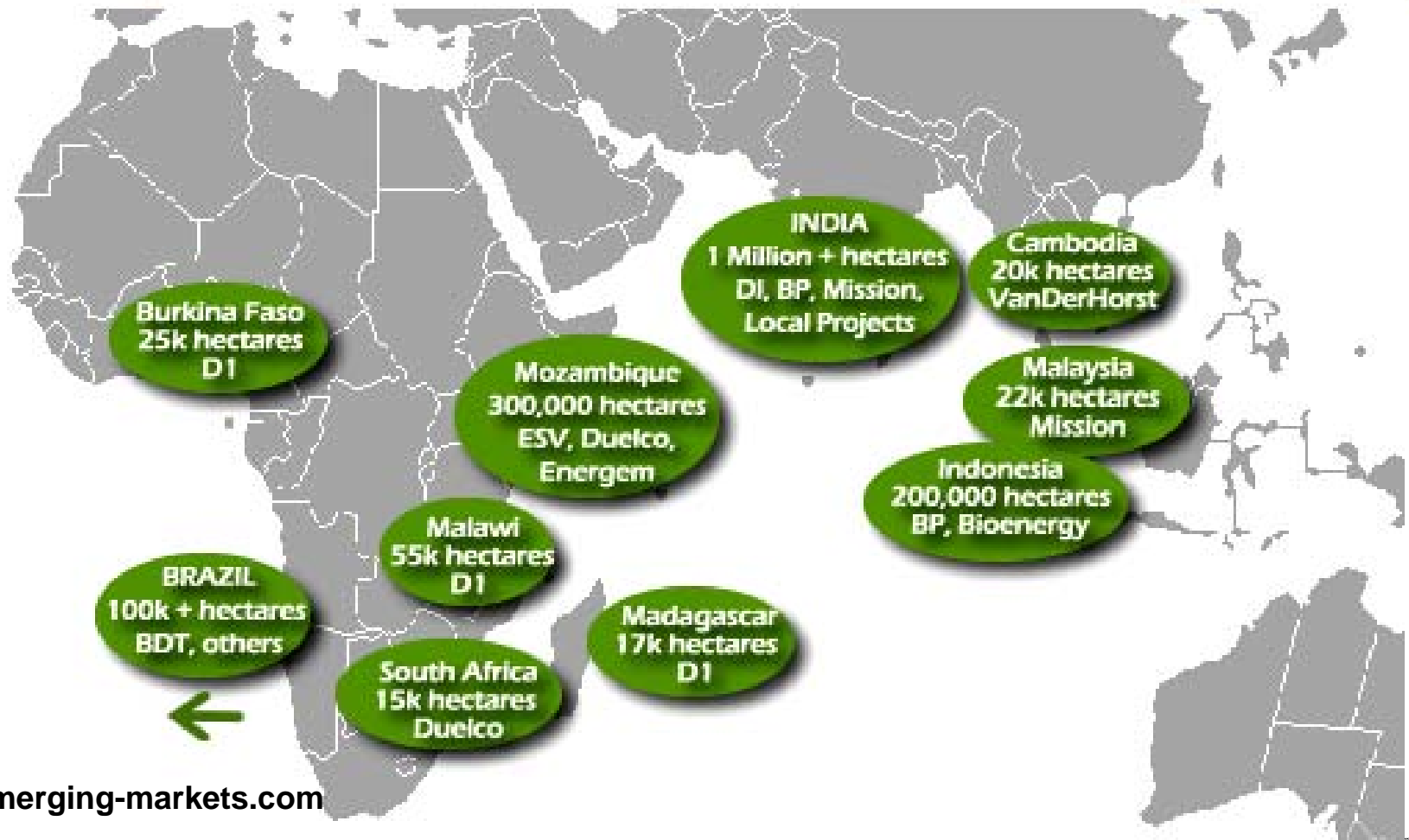
Mitigation Option: Biofuels

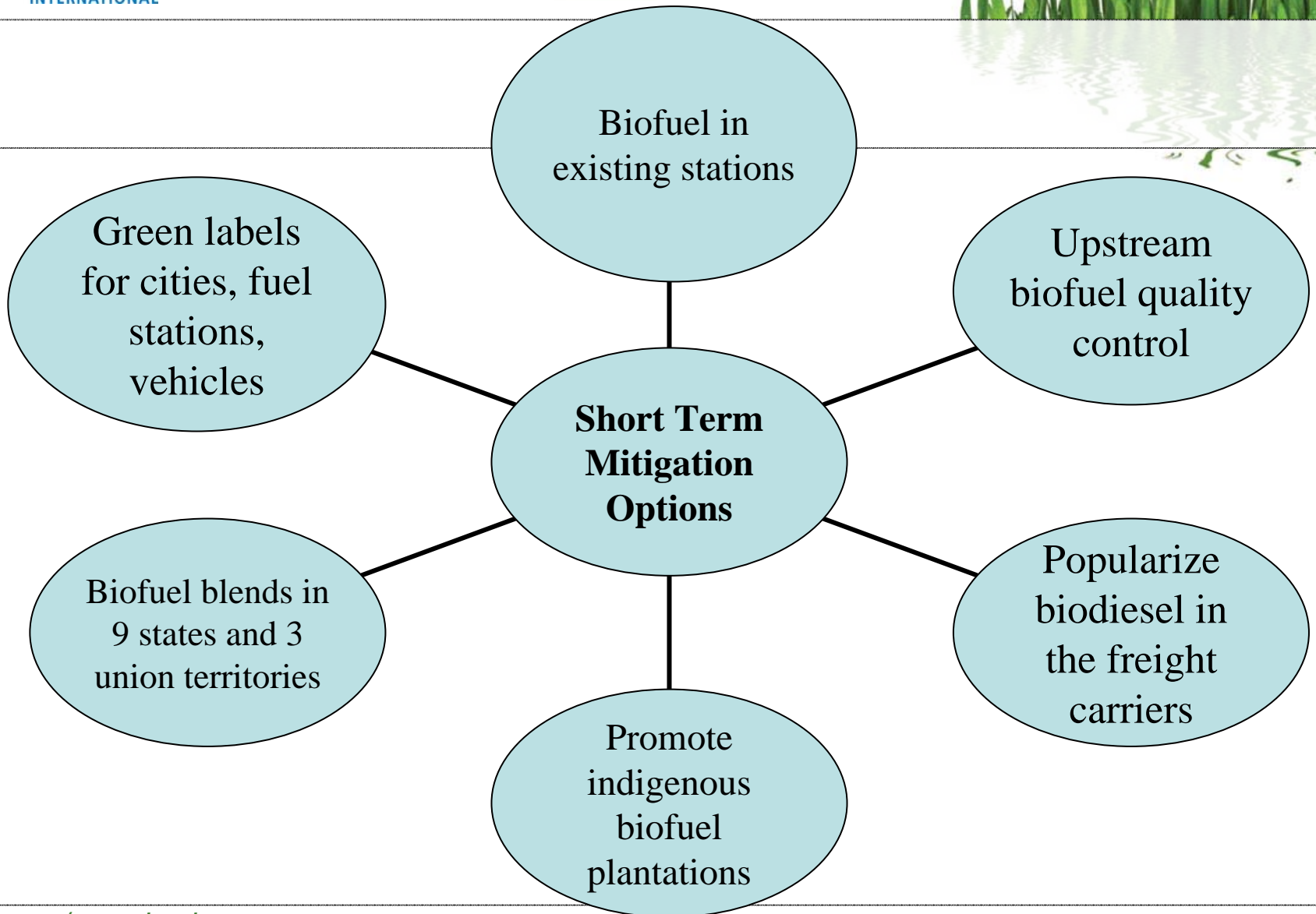
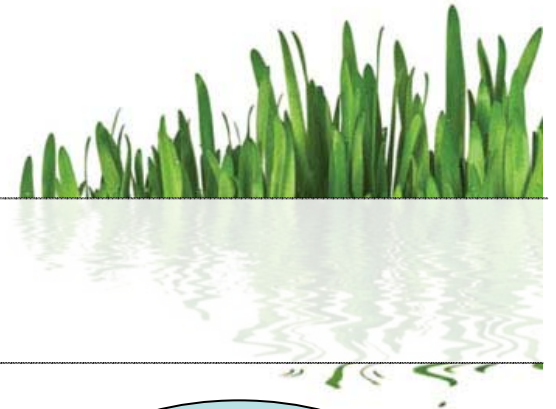
Expansion of biofuel use in all forms of transportation:

- National Mission on Biodiesel replaced by National Biofuel Policy
 - More ambitious
 - Include bioethanol and biodiesel
 - Increase the fuel mix ratio to 20% by 2017
- NAP's National Mission on Sustainable Habitat
 - Emphasis on biodiesel and biofuels development
 - Financial incentives for clean forms of transportation
 - Improvement of existing railway system



Jatropha Plantation Potential Highest in India







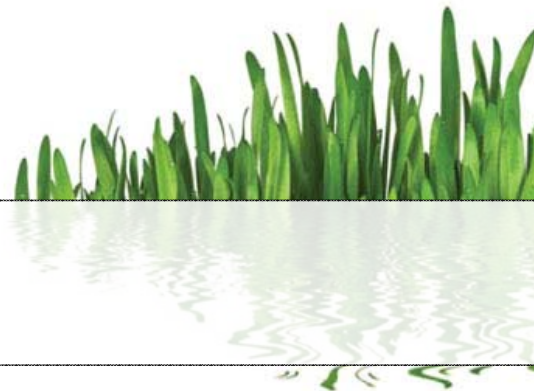
Medium and Long Mitigation Options

■ Medium Term

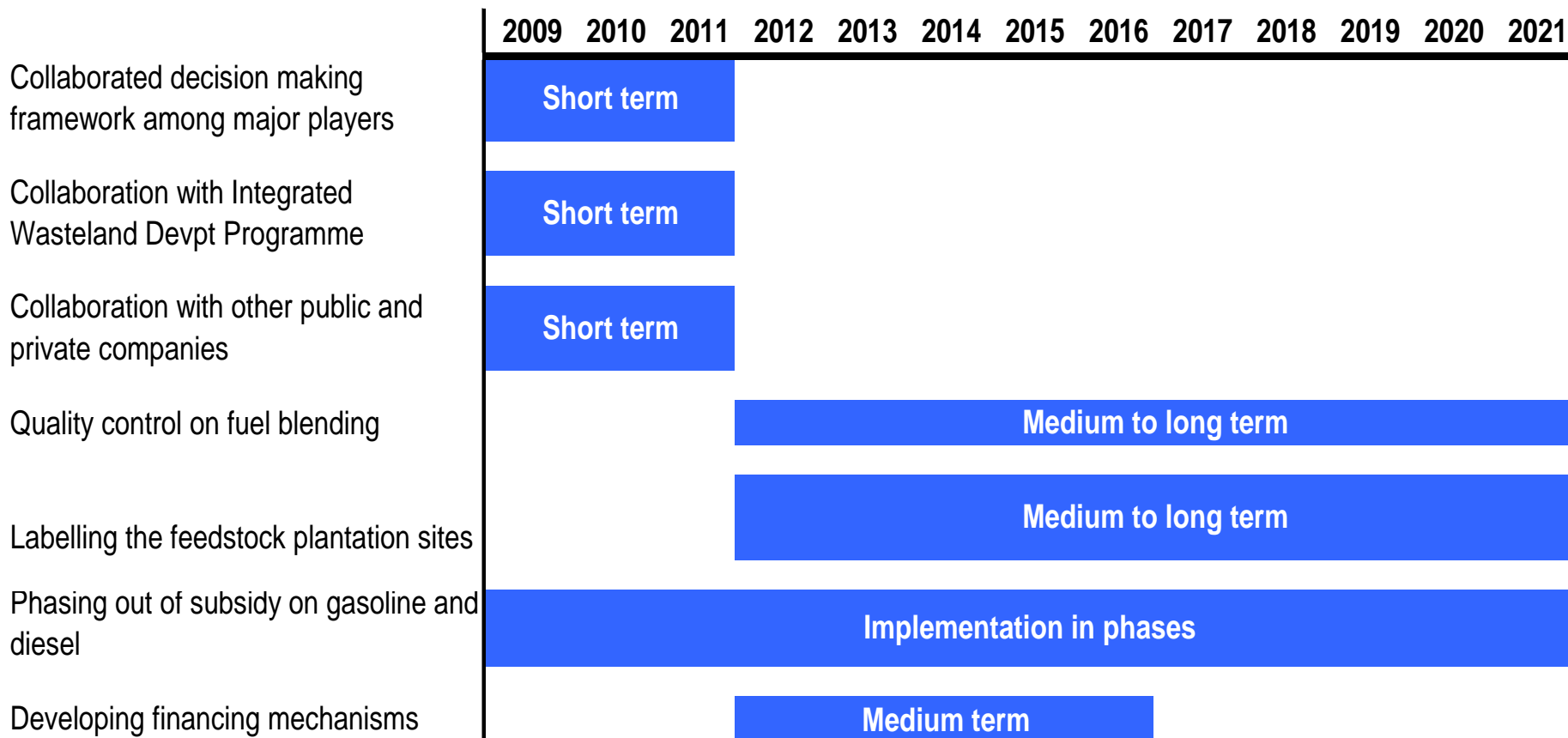
- Encourage biofuel plantations in wasteland
- Manufacture flex fuel vehicles to accommodate higher blend
- Lowering the price of biofuels
- Biofuel use expansion to be integrated with domestic biofuel production

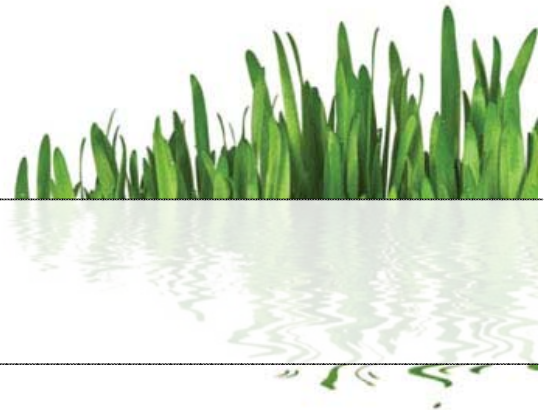
■ Long Term

- R&D for different types of feedstock
- Auxiliary management measures
- Phase out polluting vehicles



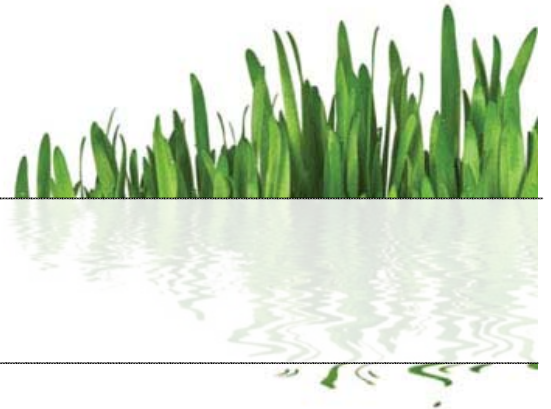
Policy Options





Conclusion

- Transportation is fast growing sector with high GHG emissions
- Need for better cooperation between ministries to bring together finances and technical capabilities
- India has high potential for biofuels and electrified urban transportation
- Achieving low carbon urban transportation is doable
- High upfront cost in low carbon transportation has attractive returns in the long run and at economies of scale



For More Information

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