



# Monitoring progress: milestones and metrics

New Delhi, September 16<sup>th</sup> 2015

*Progress should not involve the exchange of one nuisance for another nuisance.*

# Measuring Progress

- Milestones measure progress in key areas
  - Can take many forms
  - Need to be agreed
- All Milestones are time-linked
  - They are likely also to be decision gates for sequential actions
- Metrics measure milestones
  - And the gaps between



# Key Milestones in India

- Strategy development
- Planning
- Project Development
- Electricity Market (offtake)
- Cost and investment
- Infrastructure

# Strategy Development Milestones (1)

- National level roadmap
  - Strategy
  - Electricity targets based on resources
  - Revision dates set
  - Requisite actions at national level
- State-level roadmaps
  - Tactics
  - State-level actors readied
  - Collaboration opportunities / needs



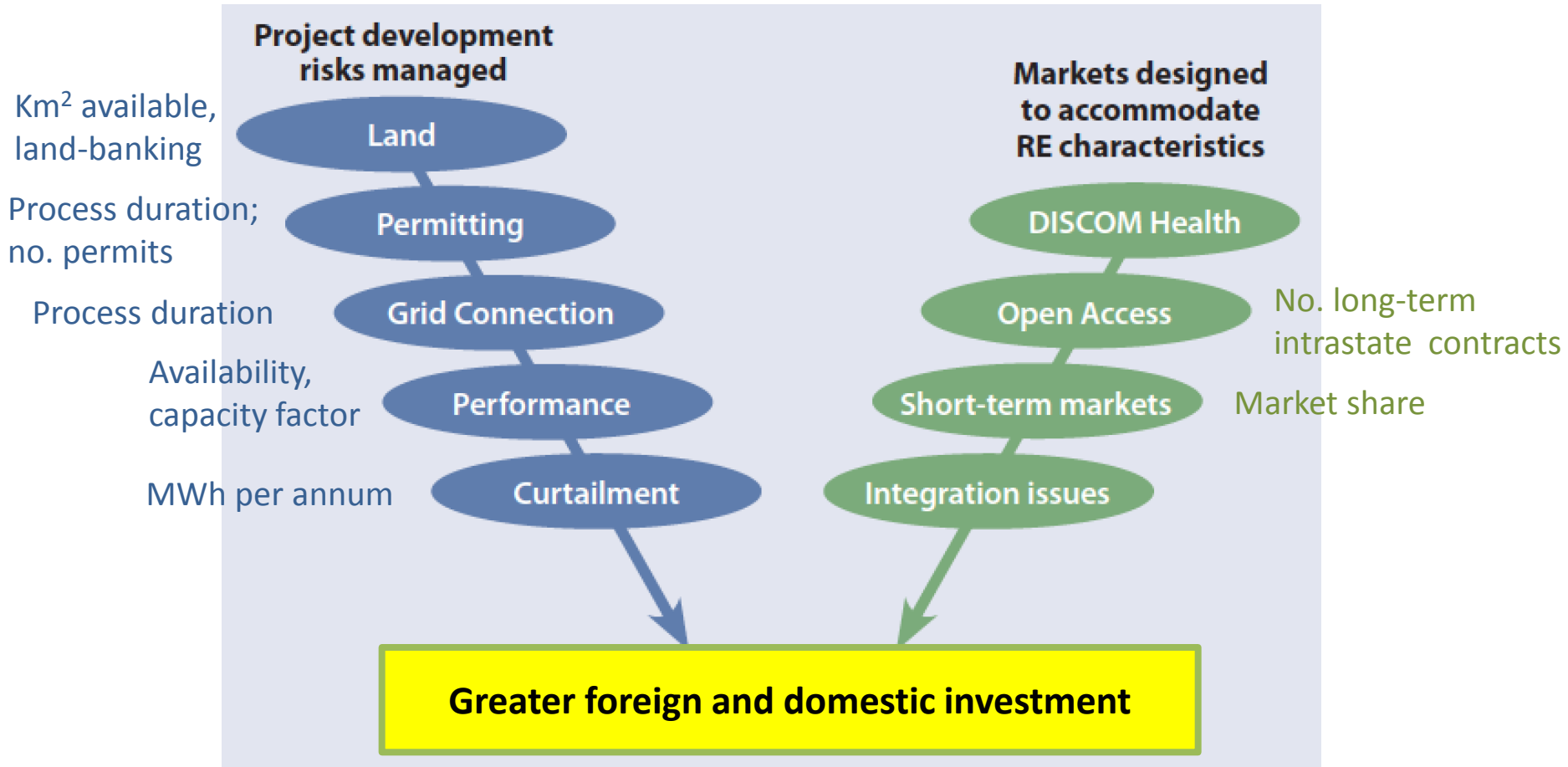
# Strategy Development Milestones (2)

- Central and state roles aligned
- Institutions aligned
- Policies aligned
  - Across conventional and renewable sectors
  - Across states
  - Power system transition policy (not just energy production)
  - Stability of the policy framework

# RE Zones and Implied Transmission



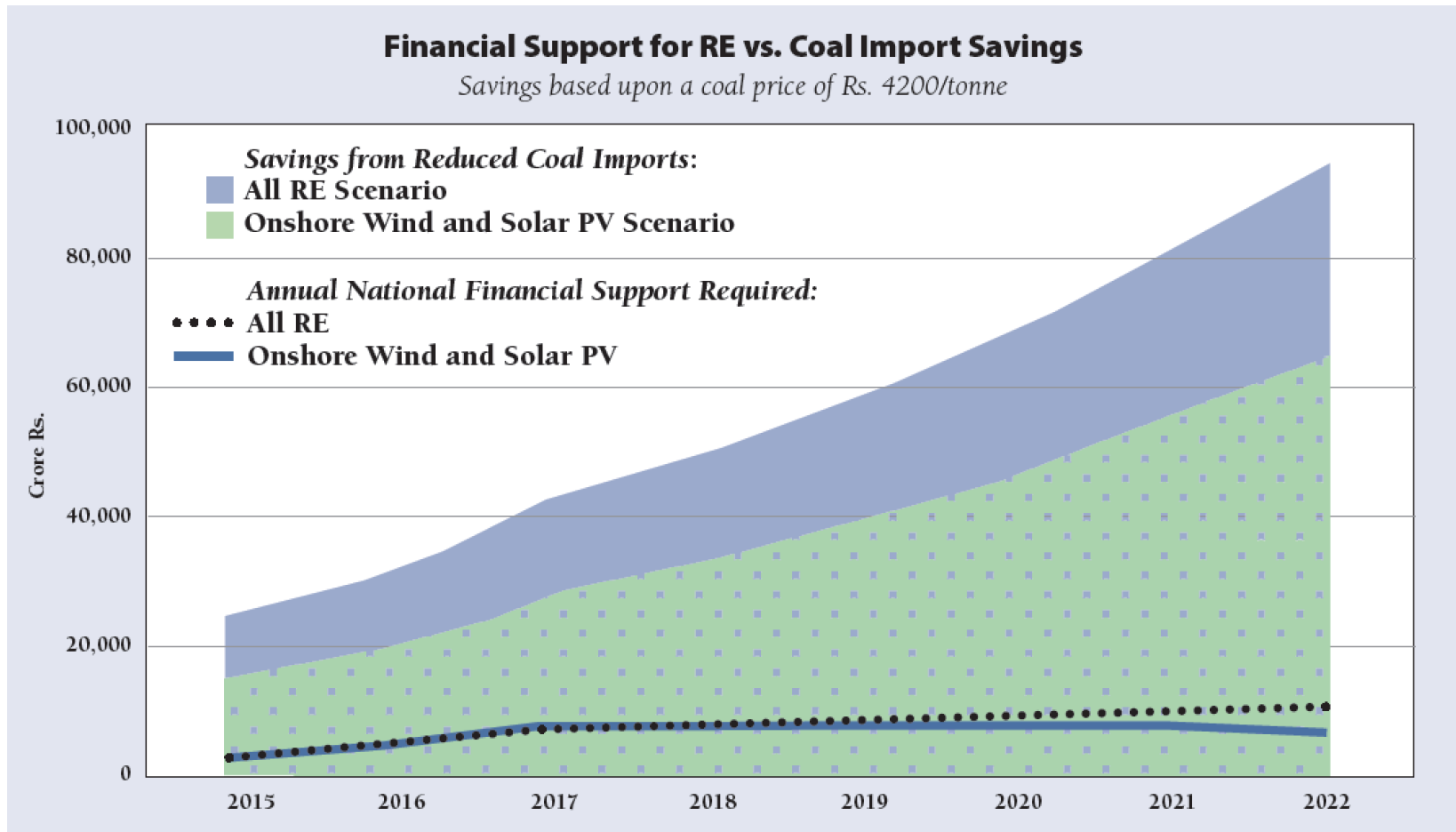
# Project and Offtake Milestones



# Cost and Investment Metrics

- Investment volume
  - Domestic and FDI, public and private
  - Loan tenors
  - Cost of capital
- Subsidy cost
  - E.g. relative to conventional
- Cost compared to conventionals
  - E.g. recent auction: INR 5.17/kWh (USD cents 8)
- Avoided cost of imported fossil fuels

# Import-Cost Saving



Source: IRR 2030 Report

# Other Socio-enviro-economic metrics

- Net job creation
- Turnover of Indian industry
- Contribution to GDP
- Access to electricity
- Reduction in carbon intensity of electricity generation
- Avoided GHG emissions per year

# Tracking progress

- EU Tracking Roadmap: latest edition June 2014
  - [http://www.keepontrack.eu/contents/publicationseutrackingroadmap/kot\\_eutrackingroadmap2014.pdf](http://www.keepontrack.eu/contents/publicationseutrackingroadmap/kot_eutrackingroadmap2014.pdf)
- UK Renewable Energy Roadmap published 2011, updated 2013
  - [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/255182/UK\\_Renewable\\_Energy\\_Roadmap\\_-\\_5\\_November\\_-\\_FINAL\\_DOCUMENT\\_FOR\\_PUBLICATION\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/255182/UK_Renewable_Energy_Roadmap_-_5_November_-_FINAL_DOCUMENT_FOR_PUBLICATION_.pdf)
- IEA (global) Wind Energy technology Roadmap, updated 2013
  - [https://www.iea.org/publications/freepublications/publication/Wind\\_2013\\_Roadmap.pdf](https://www.iea.org/publications/freepublications/publication/Wind_2013_Roadmap.pdf)
- India's 5-Year Plans

# National roadmaps worldwide



- China 2050 High Renewable Energy Penetration Scenario and Roadmap Study

- <http://www.cnrec.org.cn/english/result/2015-05-26-474.html>



- Saudi Arabia's Renewable Energy Strategy and Solar Energy Deployment Roadmap

- <https://www.irena.org/DocumentDownloads/masdar/Abdulrahman%20Al%20Ghabban%20Presentation.pdf>



- Canada Wind Technology Roadmap

- <http://www.nrcan.gc.ca/energy/renewable-electricity/wind/7323>



- USA: NREL Renewable Electricity Futures Study

- [http://www.nrel.gov/analysis/re\\_futures/](http://www.nrel.gov/analysis/re_futures/)

# Conclusions

- Progress along an identified roadmap needs to be measurable and measured
- Clear milestones help
- Some key Indian milestones to look forward to
  - First iteration of Integrated Energy Resource Planning
  - National and State-level targets for share of electricity consumption
  - Inter-state collaboration begun
  - Standard project development process across states
  - RE Development Zones identified
  - Standardised contracting for wind power
  - RPO levels reset and enforced



# HOW<sup>2</sup>GUIDE *for*

## Wind Energy

*Roadmap Development  
and Implementation*



International  
Energy Agency  
INTERNATIONAL LOW-CARBON  
ENERGY TECHNOLOGY PLATFORM



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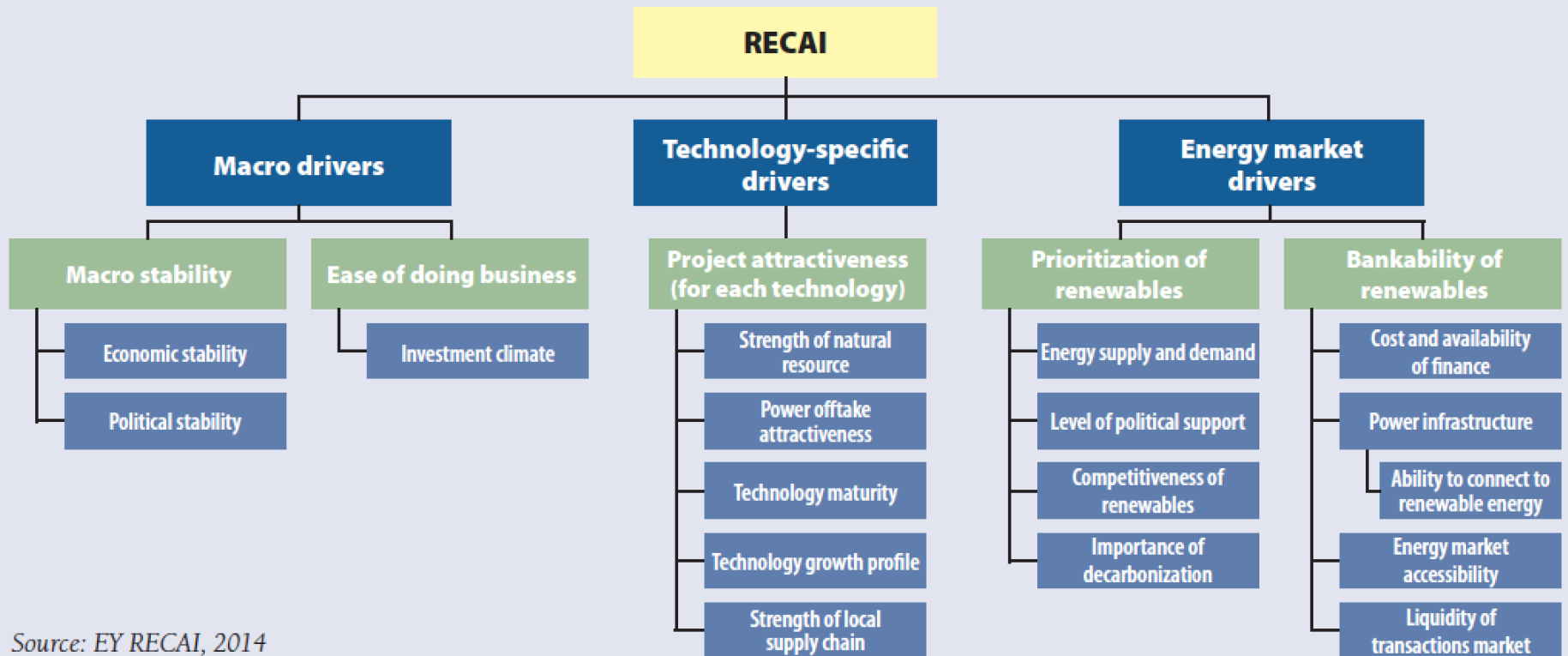
**For Governments and for Investors**

**For governments:** New Resource Partners assists with transition to modern energy systems, and with green infrastructure development more generally.

**For investors:** we identify new investment opportunities in the renewable energy space, and provide market analysis in OECD, middle income and developing countries.

# FDI Attractiveness Metrics

## Renewable Energy Country Attractiveness Index (RECAI) Criteria



Source: EY RECAI, 2014