Renewable Energy (RE) Explorer and RE Data Explorer
Introduction

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RE Explorer Web Portal

re-explorer.org

What need is the RE Explorer serving?

1. RE resource data and supporting GIS data sets are crucial to supporting decisions that achieve objectives

2. Decisions that are not data driven can lead to outcomes that don't reflect an appropriate amount of ambition, don't maximize cost effectiveness, or are infeasible to implement

3. There is a demand for resources and information on this topic

Good Data → Good Decisions

Target

Policy

Power Sector

Investment

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The RE Data Explorer is available for Mexico, Ghana, Kenya, Kazakhstan, Afghanistan, Pakistan, India, Nepal, Bangladesh, the Lower Mekong region, Indonesia, and the Philippines

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What is the RE Data Explorer?

- Extensible toolkit for RE decision-making
- Wraps complex spatial analysis techniques in an easy-to-use interface targeted at non-specialists
- Highly customizable, visually compelling interface
- Platform for distributing data and metadata.
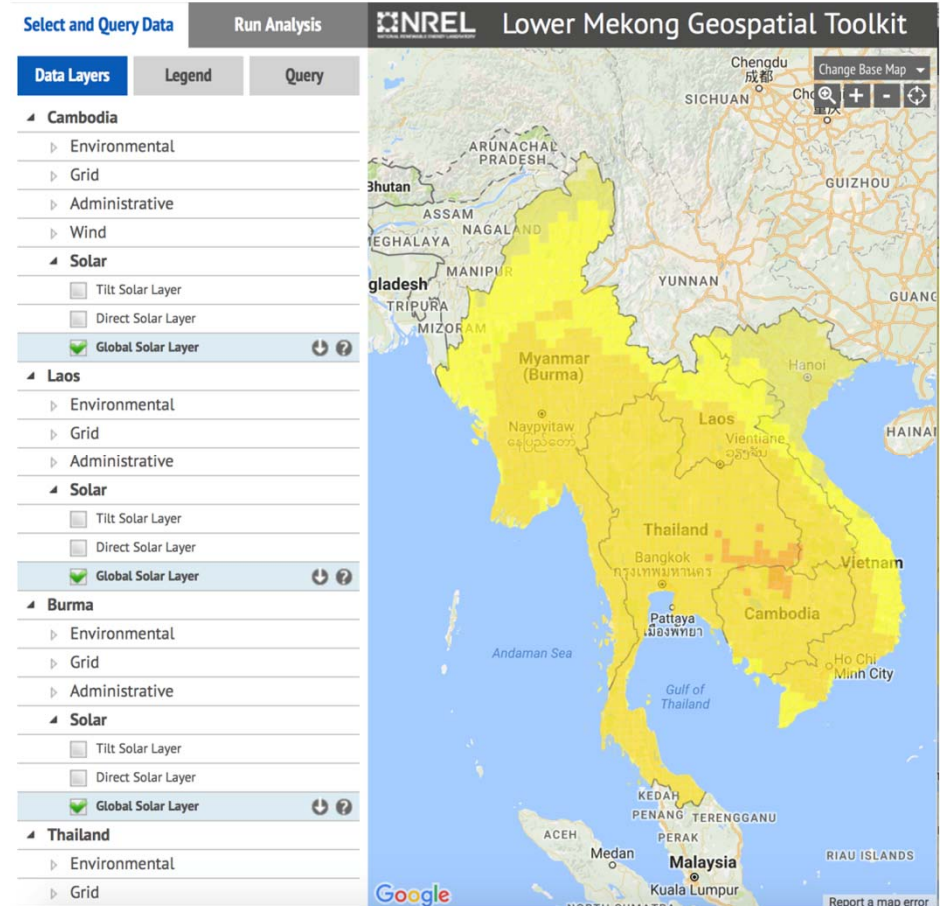
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Thank You
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RE Data Explorer: Private Sector Applications

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Outline

- Introduction
- Goals (private sector)
- Overview of energy development process
- Application of RE Data Explorer
- Questions

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NREL: National Wind Technology Center

DOE 1.5 MW

Siemens 2.3 MW

GE/Alstom 3 MW

Siemens/Gamesa 2 MW
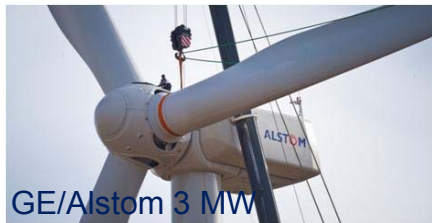
Wind Research

- Turbine testing

- Blade testing

- Drivetrain testing

2.5 and 5.0 MW Dynamometer for drivetrain testing

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National Wind Technology Center Vision

Goals:

- Improve RE production
- Reduce RE equipment and installation costs
- Improve reliability and lower operating cost
- Improve siting and eliminate barriers to large RE development

Cost of Energy

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Learning Objectives

How the RE Data Explorer supports wind development for investors and developers:

- Visualization capability
- Access to data
- Reduced project prospecting time
- Easy to use (manage/evaluate multiple layers of information to support decisions)

Overview of Wind Development

Market

Wind Resource

Land

Overview of Wind Development

3 legs of the stool:

1. Market

2. Wind Resource

3. Land

Overview of Wind Development: Market

Market

Customers

- Load forecasts = future energy needs
- Wholesale energy prices = price competiveness of RE
- Policy Drivers (Example: RPS = an appetite to buy wind)

Interconnection and transmission availability

- Location of transmission lines
- Transmission line profile:
- Size (kilovolts)
- Ownership
- Study processes
- Interconnection
- Transmission

**KH10**   animate the two highest-level bullets?

Karin Haas, 7/26/2017

Overview of Wind Development: Resource

Wind Resource

Objective: Net Capacity Factor estimate for pricing

- Find publicly available data, or
- Purchase a regional wind map, or
- Develop/purchase a model of the Wind Resource, or
- MET towers installs to validate the resource

Wind Speed at 100 meters
Republic of the Philippines
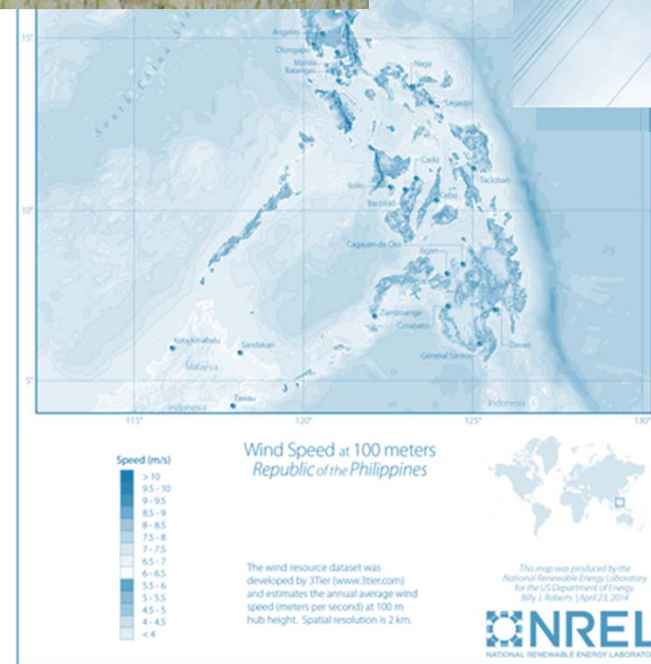
Overview of Wind Development: Land

Land

Define land uses

- Ownership (private, state or federal lands, large or small parcels)
- Proximity to urban areas -- schools, places of worship, businesses
- Location of parks, refuges, and wildlife/protected areas

Select site

- Land leasing
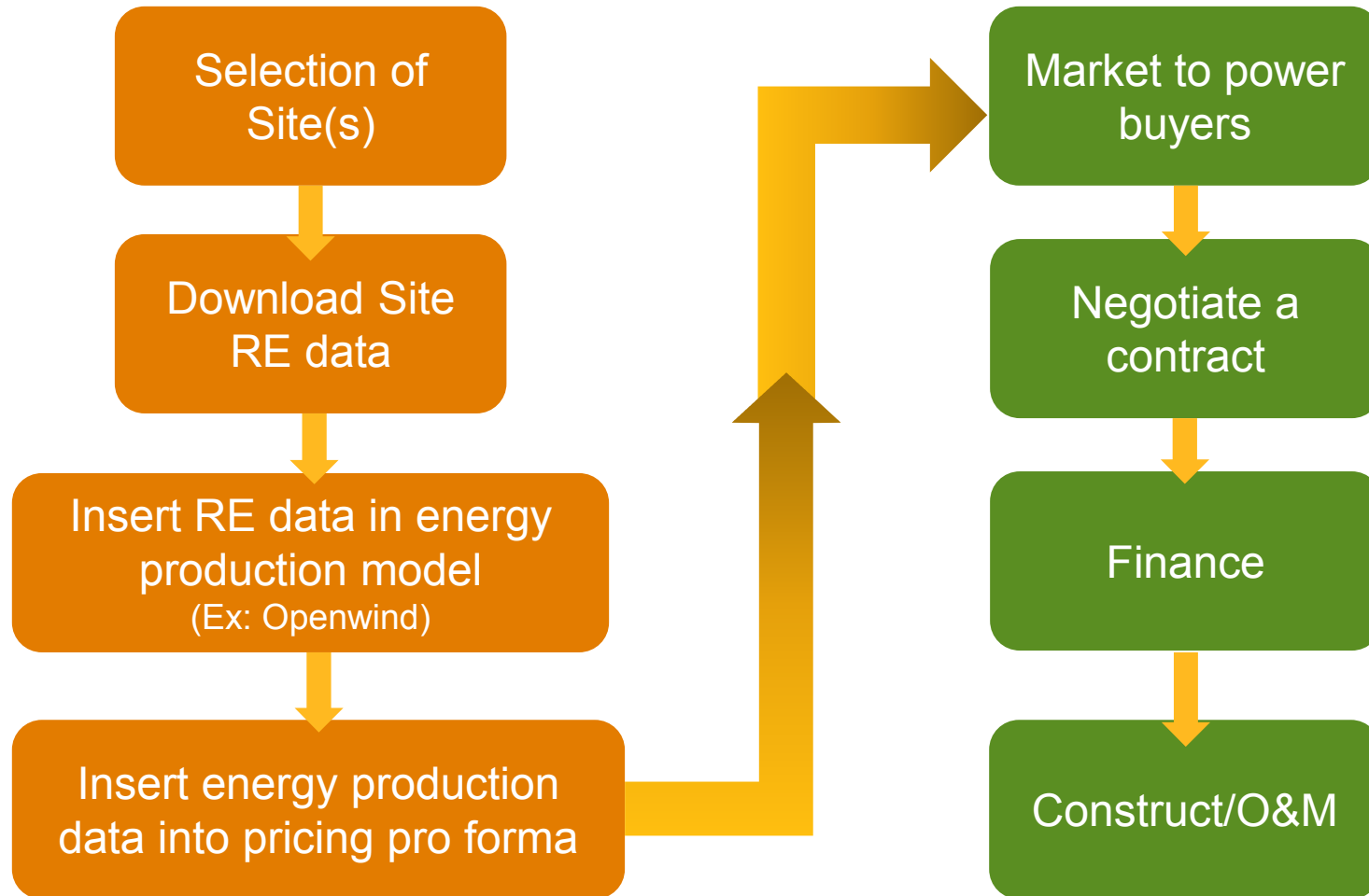- Install MET towers

Obtain permits (federal, state, local)

- Sound study
- Flicker study
- Wildlife impact studies (birds and threatened/endangered species)
- Historical preservation departments
- Job and tax benefits to community
- Environmental benefits to community (e.g., water conservation, reduced emissions)
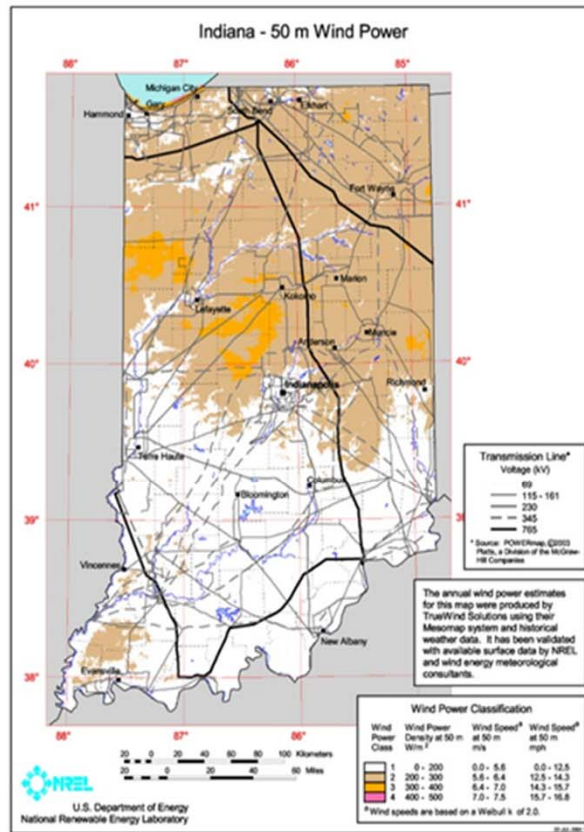- Project presentations

RE Data Explorer Supports All Three Legs of the Wind Development Stool

✓ Market – RE Data Explorer identifies transmission lines

✓ Wind Resource – RE Data Explorer identifies the wind resource (with capability of downloading raw data)

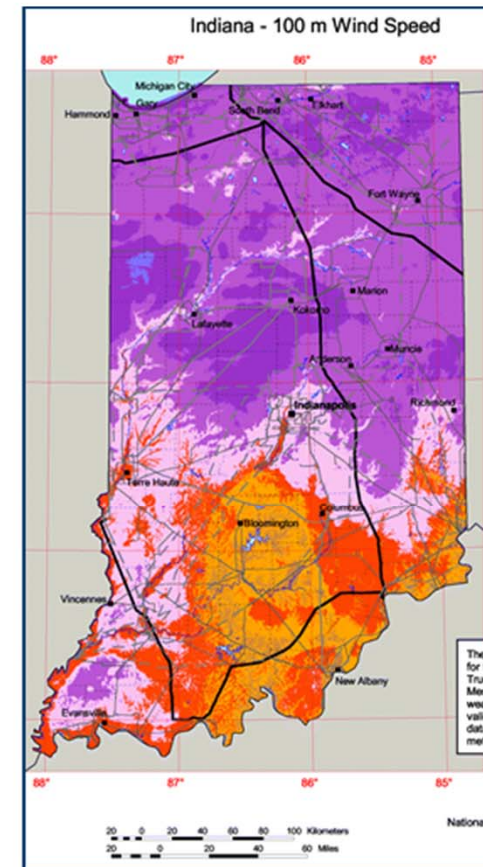✓ Land – RE Data Explorer provided information on land use, protected/environmental areas

Next Steps in Development

Selection of Site(s) → Download Site RE data → Insert RE data in energy production model (Ex: Openwind) → Insert energy production data into pricing pro forma → Market to power buyers → Negotiate a contract → Finance → Construct/O&M

Data Tools versus Static Maps

Best areas 6.4-7.0 m/s
Capacity factors 25-30%

Best areas 7.5-8.2 m/s
Capacity factors 40-45%

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RE Data Explorer Demonstration

Demonstration

RE Data Explorer: Developer and Policymaker

Often the private sector works cooperatively with government agencies to develop a region/country's RE resources.

Questions that are answered together:

- What is the quantity of the RE resource potential?
- What is the economic development potential (i.e., jobs, tax revenue)?
- What incentives might be developed to stimulate investment?
- Where is the location of the resource?
  - Siting requirements
  - Balance environmental issues with clean energy goals
  - Establish Renewable Energy Zones
  - Coordinate with utilities on transmission development

What We've Learned

Wind developers and investors can use the RE Data Explorer to support wind development. The RE Data Explorer provides:

- Improved access to data

- Increased capability regarding graphical representation

- Easy to use (managing and evaluating multiple layers of data graphically on one screen to support decision-making)

- Improved efficiency for project prospecting

  - Saving time and money

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Results

Investment in home grown renewable power

Results

Generating low-cost energy

Questions

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