



Central Asia Regional Consultation Meeting

Baku, 20 October 2016

An Overview of IRENA Tools and Facilitation Support

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Senior Programme Officer – Regions

Resource Assessment and Planning

- Global Atlas
- SPLAT

Enabling Frameworks

- Policy, regulatory and institutional enabling
 - Renewables Readiness Assessment
 - Country REmap 2030
 - RE target setting and support schemes
 - Support to statistics, regulators, etc.
- Technical enabling
 - Grid integration of VRE

Access to Finance

- Sustainable Energy Marketplace
- Project Navigator
- IRENA/ADFD Financing Facility

Regional Approaches

- Clean Energy Corridors

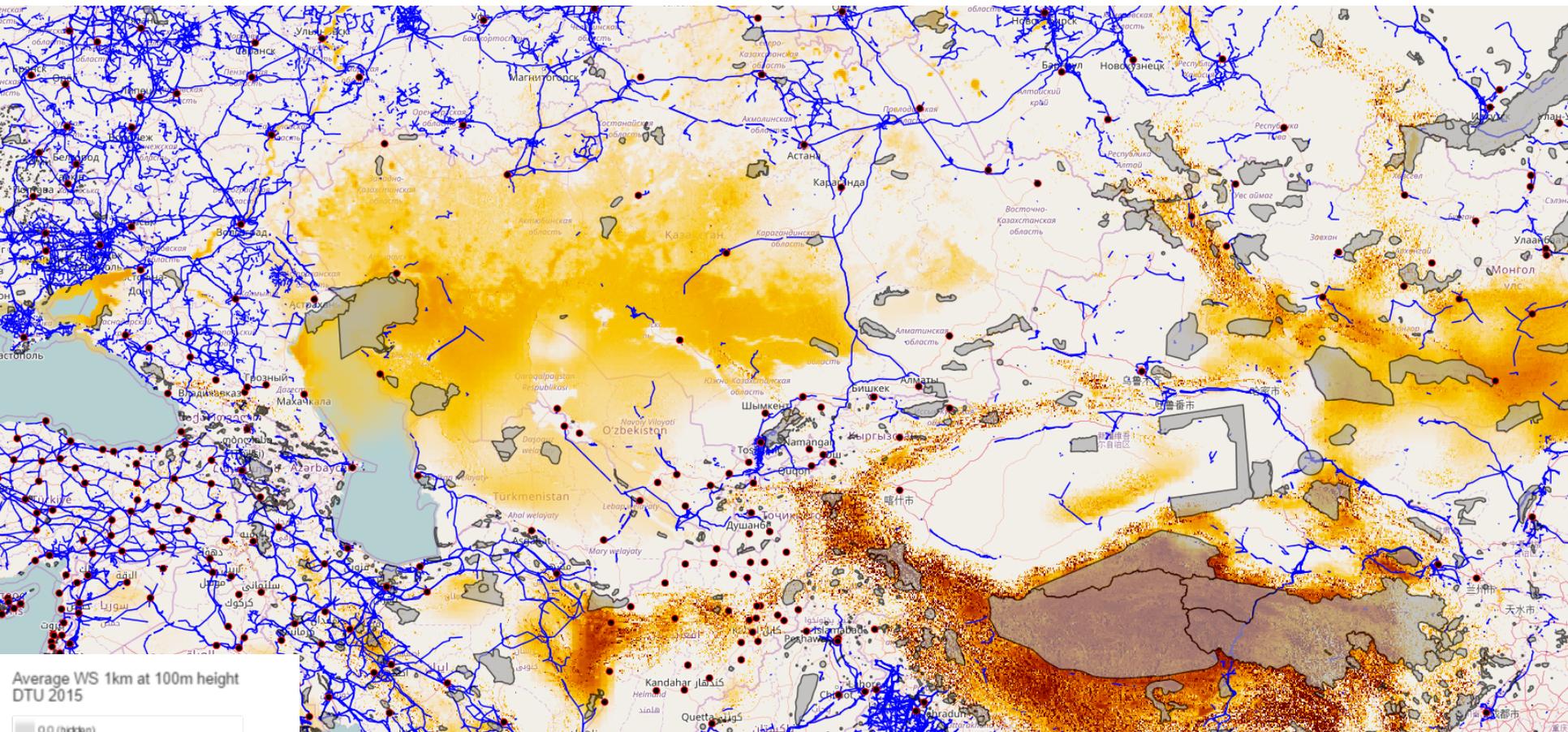
- » Largest initiative to **assess renewable energy potential** on a global scale
- » Creates high-resolution **resource maps**
- » Includes **solar, wind, geothermal, bioenergy and ocean energy resources** (expanding to encompass **all renewable energy resources**)



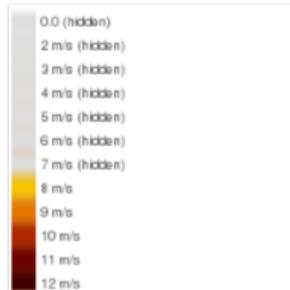
Global Atlas FOR RENEWABLE ENERGY



Wind Resources in Central Asia

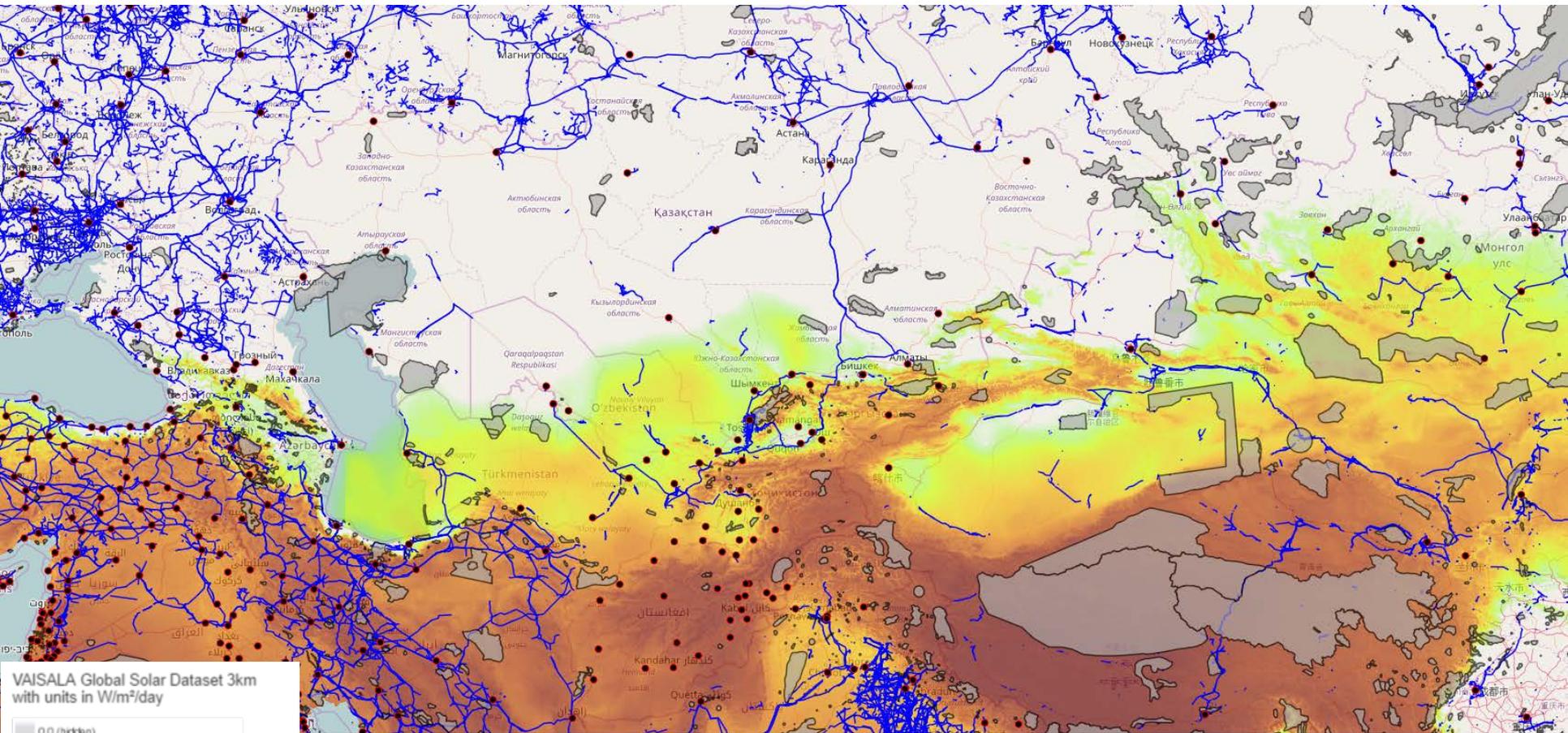


Average WS 1km at 100m height
DTU 2015

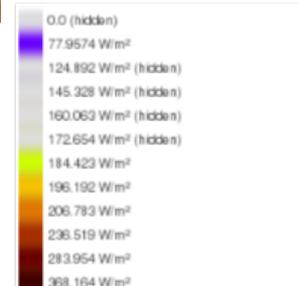


This map is generated by the Global Atlas for Renewable Energy (<http://www.irena.org/GlobalAtlas>), using OpenStreetMap (openstreetmap.org) as base map.

Solar Resources in Central Asia



VAISALA Global Solar Dataset 3km with units in W/m²/day

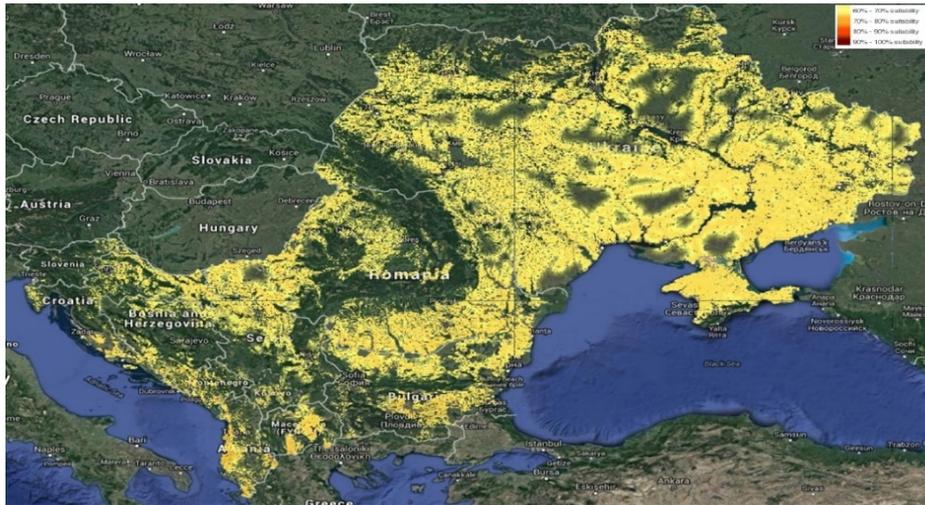


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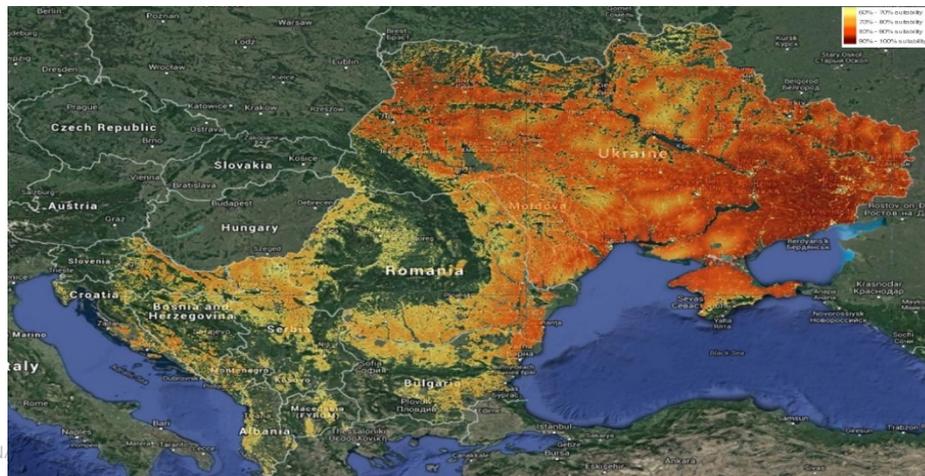
RE Resource Assessment

Suitability maps

Suitable locations for Solar PV investments in SEE



Suitable locations for Wind investments in SEE



RE Resource Assessment

Zoning

- A multi-criteria spatial analysis of renewable energy resources (for PV, CSP and wind) for identification of **high potential, cost effective, realistically achievable RE resource development zones/project opportunity areas.**
- In order to inform **long-term transmission planning** and leverage existing and planned electricity infrastructure to promote more rapid development of RE plants

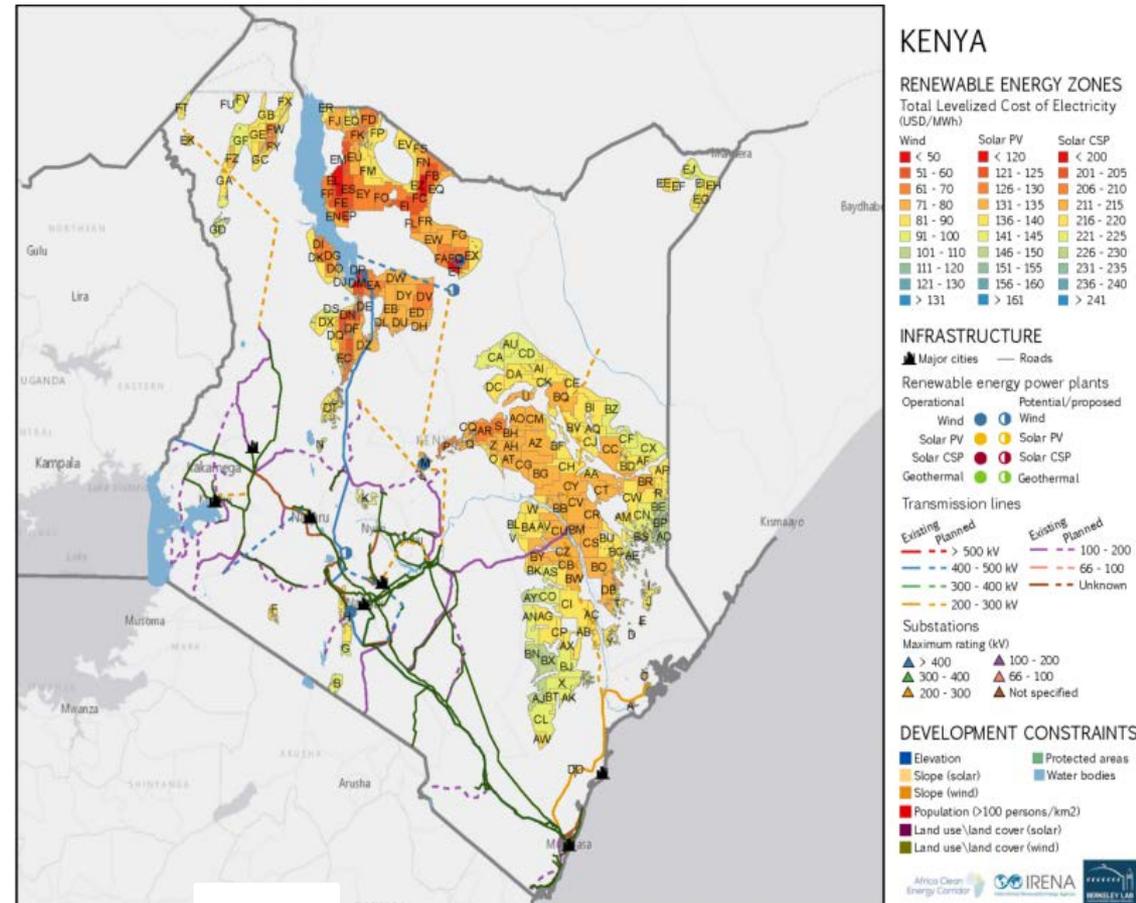


FIGURE 35: Kenya wind zones as shown in the interactive PDF map.

Zones are labeled using unique zone identification letters that correspond to zones in the multi-criteria scoring zone-ranking tool.

- Due diligence process for selected sites within the identified RE zones to develop:
 - a renewable power Generation Model, using high resolution time series data for the RE technology
 - a Financial Model, including cash flow projections and IRR for the site
- Currently piloted in selected wind sites in Comoros and Cape Verde to help:
 - decision makers in designing RE procurement process
 - investors in assessing financial viability of the project

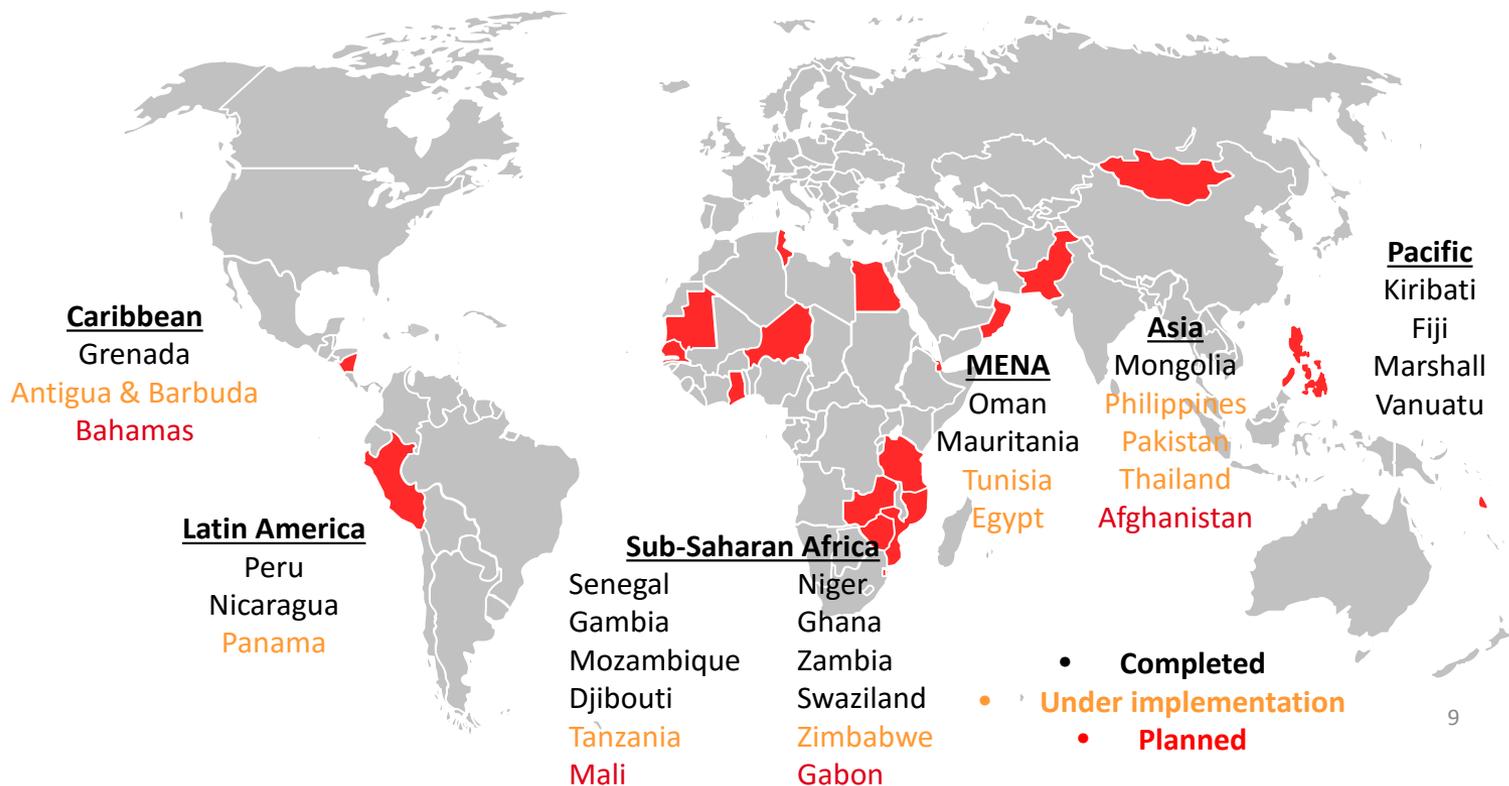
Enabling Frameworks

Renewables Readiness Assessment (RRA)

- ❑ Identification of obstacles hindering accelerated RE deployment

Recommendations for short / medium-term actions to overcome the identified challenges

- ❑ Country-initiated, country-led process; IRENA as facilitator
- ❑ Inclusive and multi-stakeholder process promoting consensus
- ❑ Process establishing a basis for future collaboration

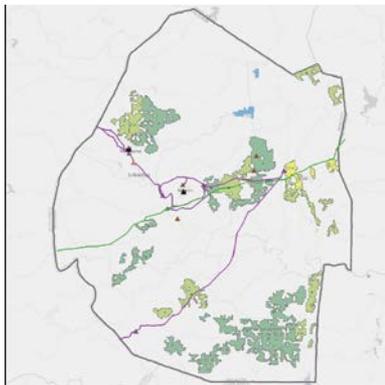


Enabling Frameworks

Renewable Energy Planning

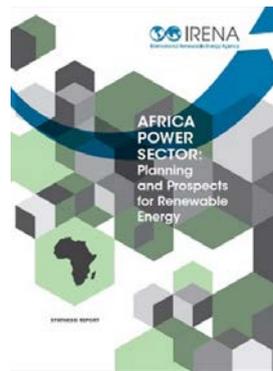
Swaziland (Capacity Building Programme):

- Energy planning **capacity building** programme to strengthen **energy planning capacity** within the local institutions (Ministry)
- Based on IRENA's power sector investment planning tool (**System Planning Test / SPLAT-S model**) and Wind and Solar Zoning results (**MapRE zoning**)
- Leading to an **Energy Master Plan**



MapRE Zoning

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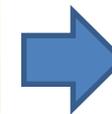


SPLAT - S

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Training Programme



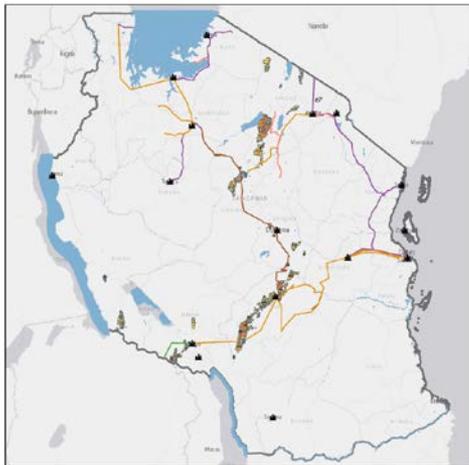
**ENERGY
MASTER
PLAN**

Enabling Frameworks

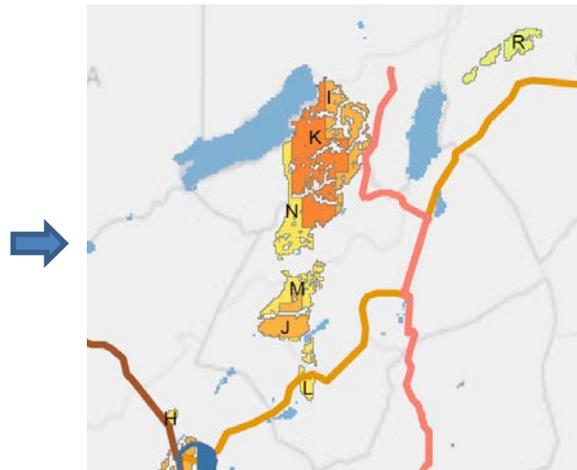
Renewable Energy Planning

Tanzania (Renewables Readiness Assessment):

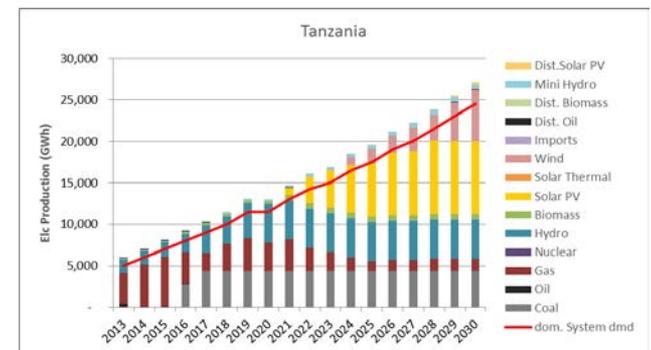
- Most cost-effective RE zones (wind, solar PV and CSP) incorporated into planning process to develop a **least-cost optimization model** for the power generation
- Enabling analysts to **assess investment paths** to achieve different policy goals



MapRE Zoning



Best zones selected
(Generation potential and LCOE)



Least cost electricity
generation mix

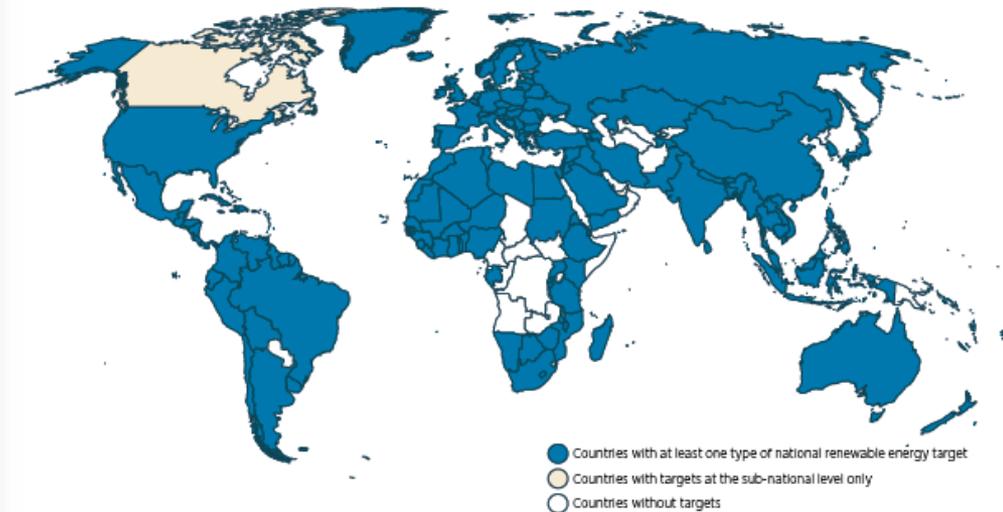
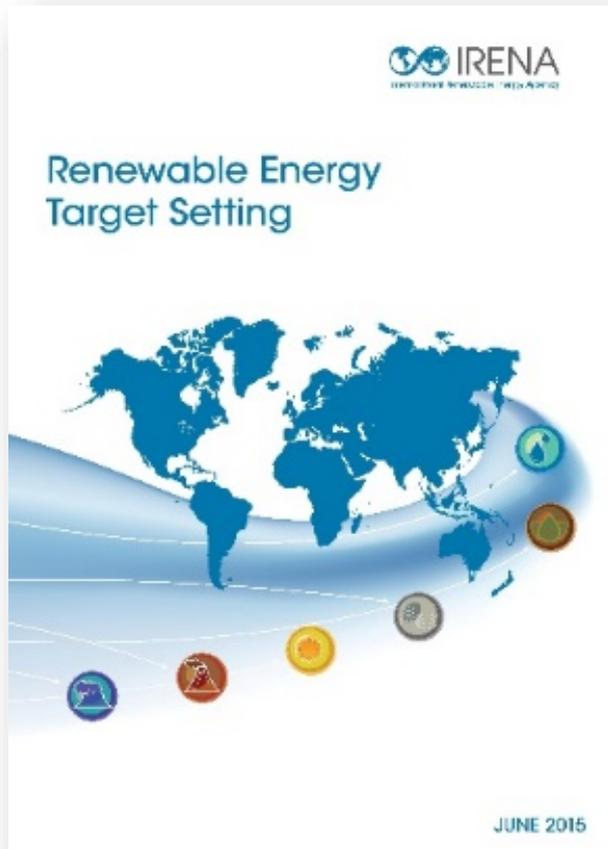
Enabling Frameworks

Renewable Energy Targets

Spectrum of Renewable Energy Targets

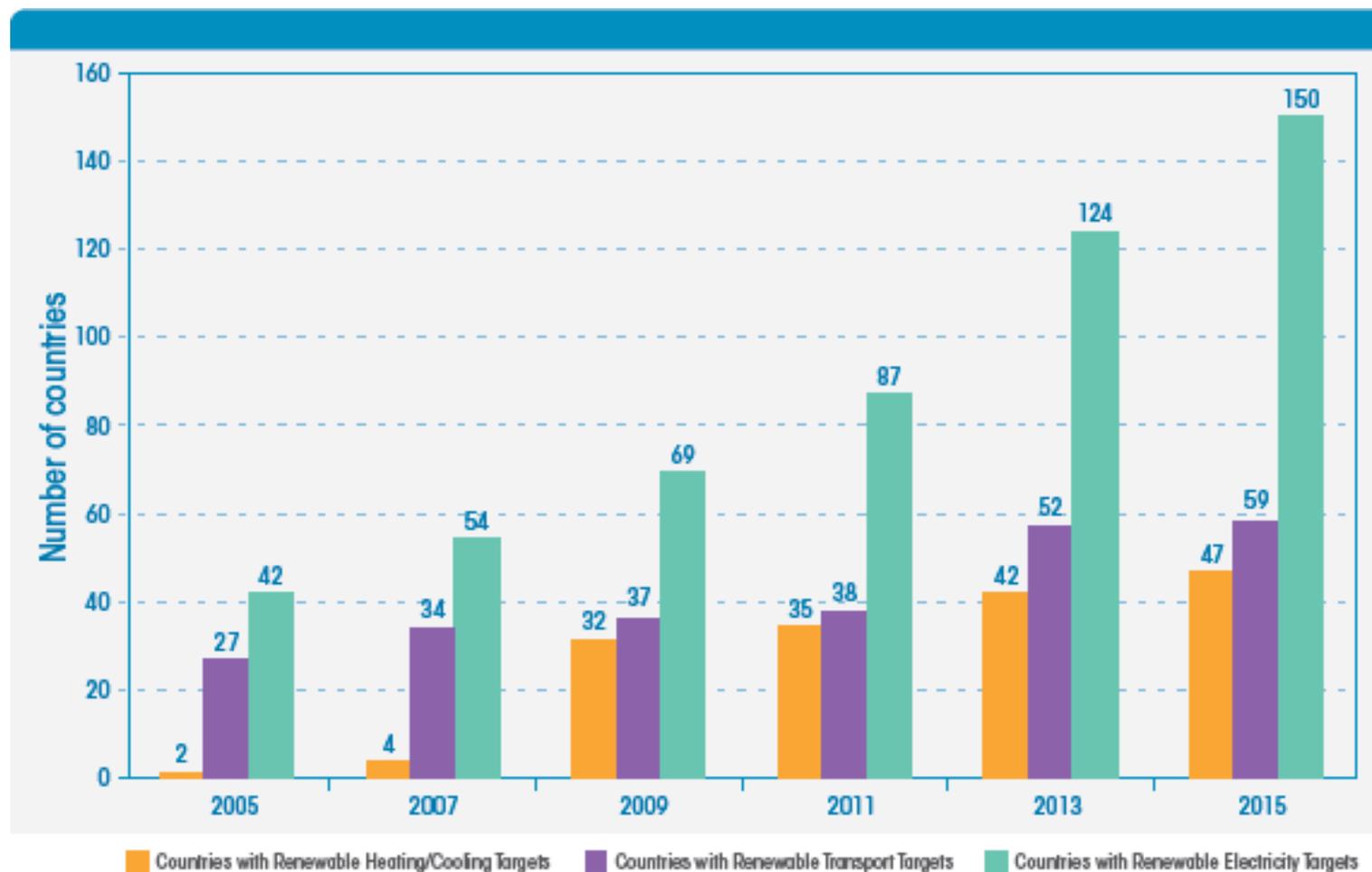


Targets in the global renewable energy landscape



Today, 164 countries have at least one type of renewable energy target – up from 43 in 2005.

Evolution of Global RE Targets by Sector



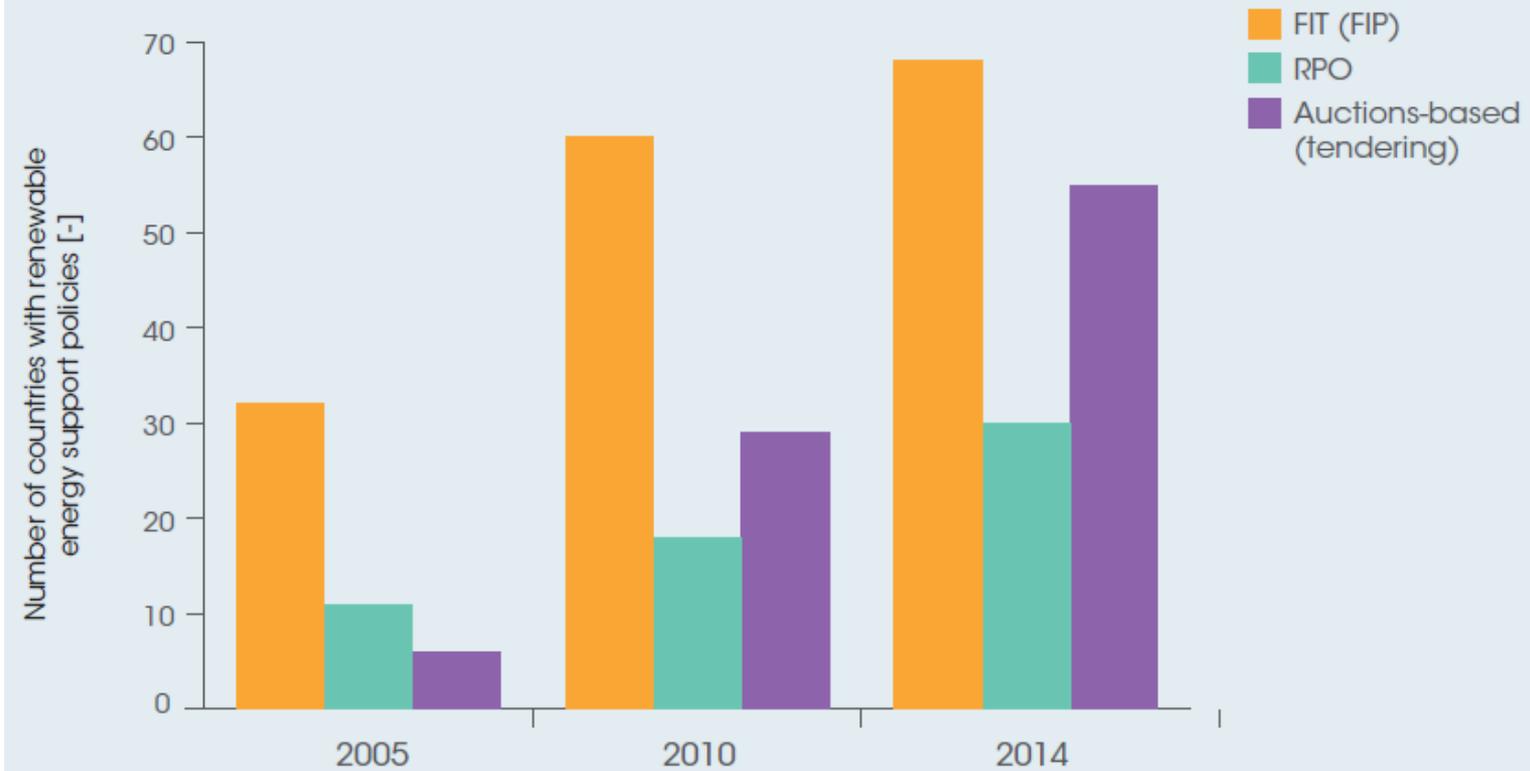
Source: IRENA based on REN21, 2005, 2007, 2009, 2011, 2013, 2014.

While renewable electricity targets are the most widespread type, heating/cooling and transport sector targets have increased significantly over the last decade.

Enabling Frameworks

Renewable Energy Support Schemes

Number of countries with renewable energy policies, by type



Auctions combine elements of tariff-based schemes with quantity-based schemes



Moved from a feed-in tariff to auctions



Moved from auctions to a feed-in tariff



Implemented auctions and a feed-in tariff simultaneously

FITs, FIPs and Auctions

	FITs	FIPs	Auctions
Strengths	Limits the risks for investors also in emerging technologies	Fixed premiums encourage generators to react to market signals	Flexibility in the design according to conditions and objectives
	Facilitates the entry of new players in the market	Sliding premiums or capped fixed premiums minimise the support cost	Permit real price discovery
	Often funded by consumers and not exposed to public budget cuts	Limit risk for investors, especially premiums with floor	Provide greater certainty regarding prices and quantities
	Long term security drives technological development	Flexible designs and well suited for liberalized electricity markets	Enable commitments and transparency
Weaknesses	Costly with high deployment rates and Generation is not exposed to electricity market prices	Fixed premiums without floor create risk for investors	Are associated with relatively high transaction costs for both developer and auctioneer
	Tariff setting and tariff adjustment process is challenging and complex	Premium setting and adjustment process is challenging and complex	Risk of underbuilding and delays

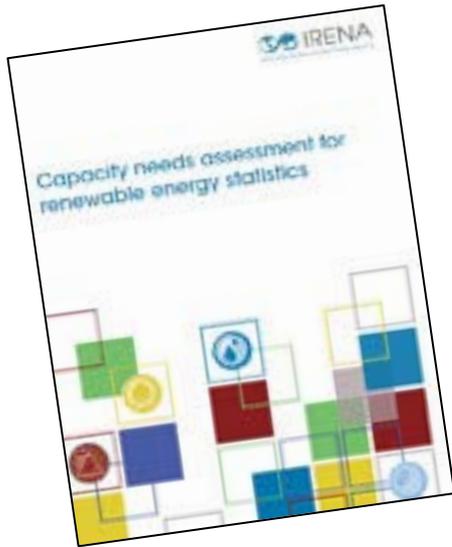
Renewable Energy Auctions



RENEWABLE ENERGY AUCTIONS
A GUIDE TO DESIGN



Capacity Needs Assessment for RE Statistics



- Guide to help energy statisticians understand the various elements and processes involved in renewable energy data collection and management.
- Includes assessment tools that countries can use to identify areas of weakness.

Solid legal and institutional framework

Well defined data requirements

Sufficient skilled personnel

Clear methodologies and processes

Appropriate data collection mechanisms

Analysis and validation procedures

Mechanism for data dissemination

Technical Enabling

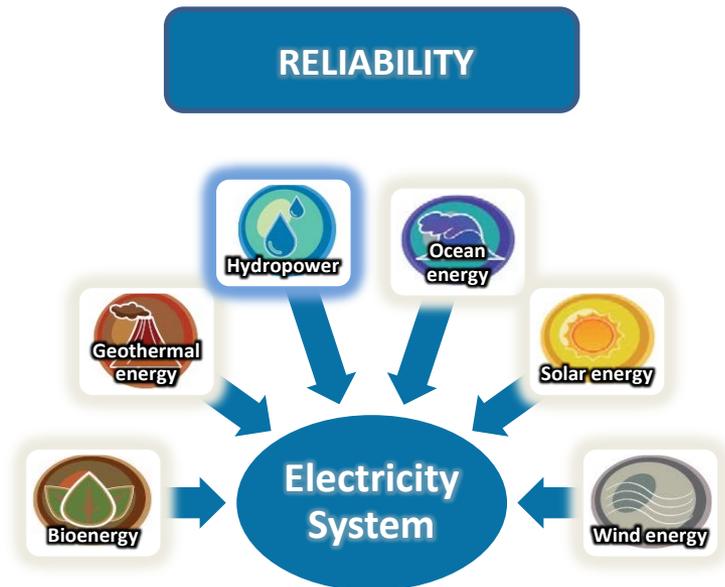
Grid Integration

Without relying on battery storage, renewables produced **38% of Spain's** electricity from January to October 2015.

41% of Danish electricity demand was met with wind (roughly 40%) and solar (2%) last year. A level of **87%** is expected just nine years from now, including 61% wind power and 3% solar PV.

Grid Integration Study:

- How much VRE can be integrated without major system upgrades?
- Is it feasible to achieve the target shares of VRE?
- What is required to achieve the target shares of VRE?



Dominican Republic, Antigua & Barbuda

(study), **Barbados** (revision of studies),
CARILEC (technical workshops), **Cuba**
(planning workshop)

Samoa, Cook Islands, Palau
(studies), **Kiribati** (support in
realisation of study), **Fiji,**
Vanuatu (on-going studies,
technical workshops)

Central America, starting technical
study. This initiated a step moving
towards bigger systems.

Seychelles (review
of studies)

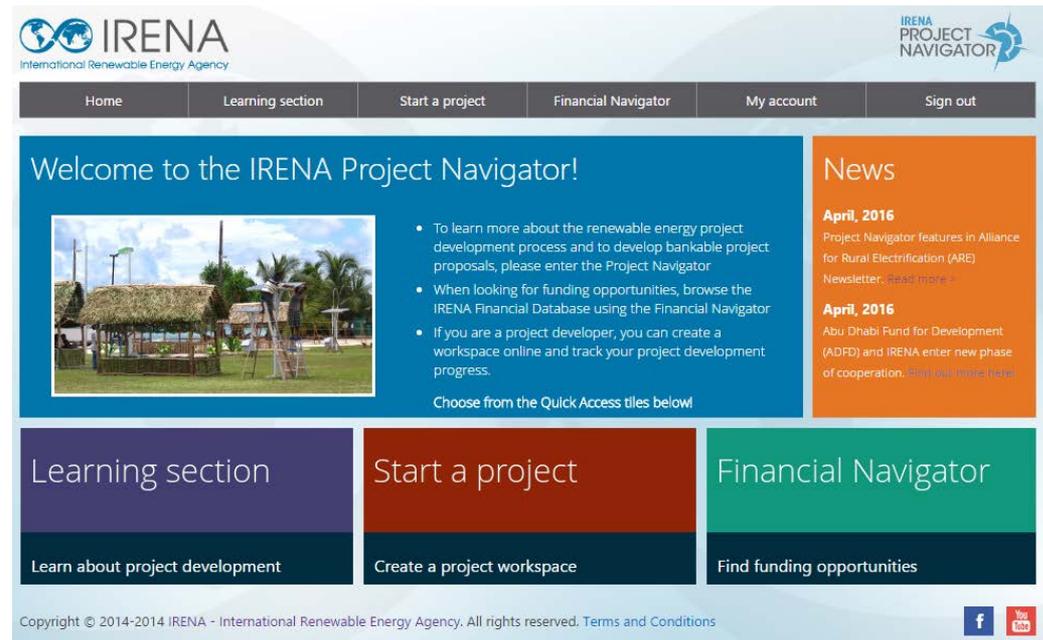
Focus moving from small islands to larger interconnected systems

Financial Enabling Project Navigator

A comprehensive platform giving project developers the tools – at no cost – to create robust, bankable renewable energy project proposals.



IRENA Project Navigator users worldwide



The screenshot shows the IRENA Project Navigator website. At the top, there is a navigation bar with links for Home, Learning section, Start a project, Financial Navigator, My account, and Sign out. The main content area features a welcome message, a list of bullet points, and a 'News' section with two articles from April 2016. Below this are three large colored tiles: 'Learning section' (purple), 'Start a project' (red), and 'Financial Navigator' (green). The footer contains copyright information and social media icons for Facebook and YouTube.

IRENA
International Renewable Energy Agency

IRENA PROJECT NAVIGATOR

Home Learning section Start a project Financial Navigator My account Sign out

Welcome to the IRENA Project Navigator!

- To learn more about the renewable energy project development process and to develop bankable project proposals, please enter the Project Navigator
- When looking for funding opportunities, browse the IRENA Financial Database using the Financial Navigator
- If you are a project developer, you can create a workspace online and track your project development progress.

Choose from the Quick Access tiles below

News

April, 2016
Project Navigator features in Alliance for Rural Electrification (ARE) Newsletter. [Read more >](#)

April, 2016
Abu Dhabi Fund for Development (ADFD) and IRENA enter new phase of cooperation. [Find out more here](#)

Learning section
Learn about project development

Start a project
Create a project workspace

Financial Navigator
Find funding opportunities

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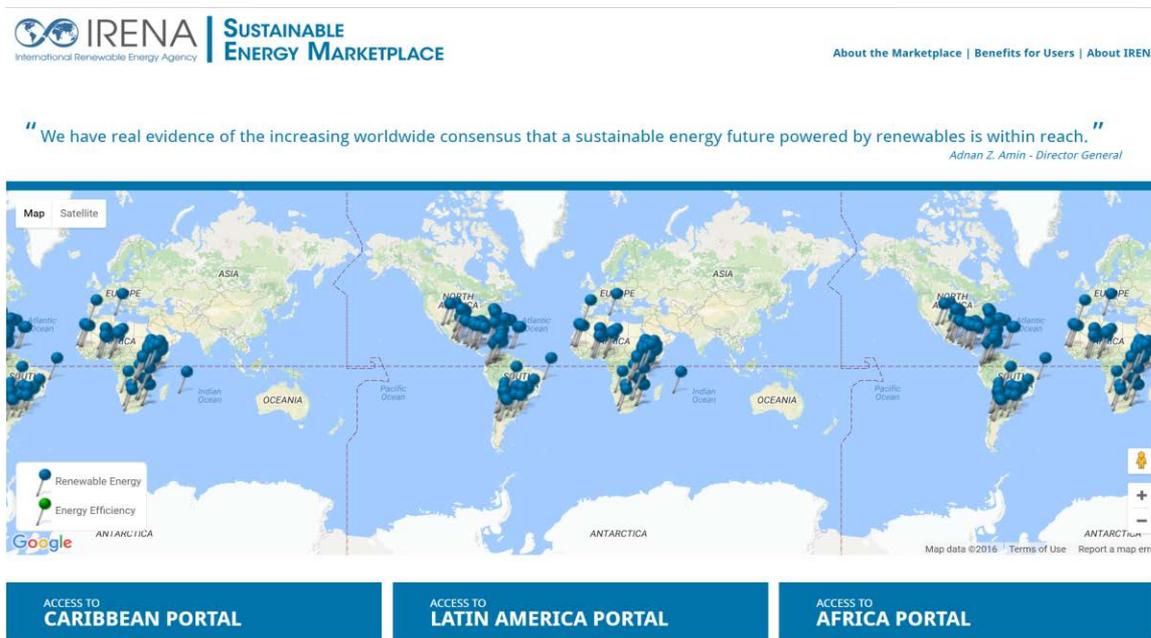
f YouTube

Find us at www.irena.org/navigator

Financial Enabling Sustainable Energy Marketplace

A virtual platform that gathers all RE actors and IRENA's expertise to support RE project initiation, development and financing

Find us at marketplace.irena.org



Nr of projects	16	72	62
Total installed capacity (MW)	368	1,948	988
Total investment (USD)	0.9 bn	3.8 bn	2.4 bn

Financial Enabling

IRENA-ADFD Financing Facility

- » Supporting **innovative, replicable** RE projects in developing countries
- » **USD 350 million** over seven rounds
- » Concessional loans from **Abu Dhabi Fund for Development (ADFD)**
 - USD 5 to 15 million per project
 - Up to 50% of the estimated project cost
 - 1-2% interest rate
 - Repayment in 20 years, incl. 5-year grace
- » Technical review by IRENA and commitment by **ADFD**

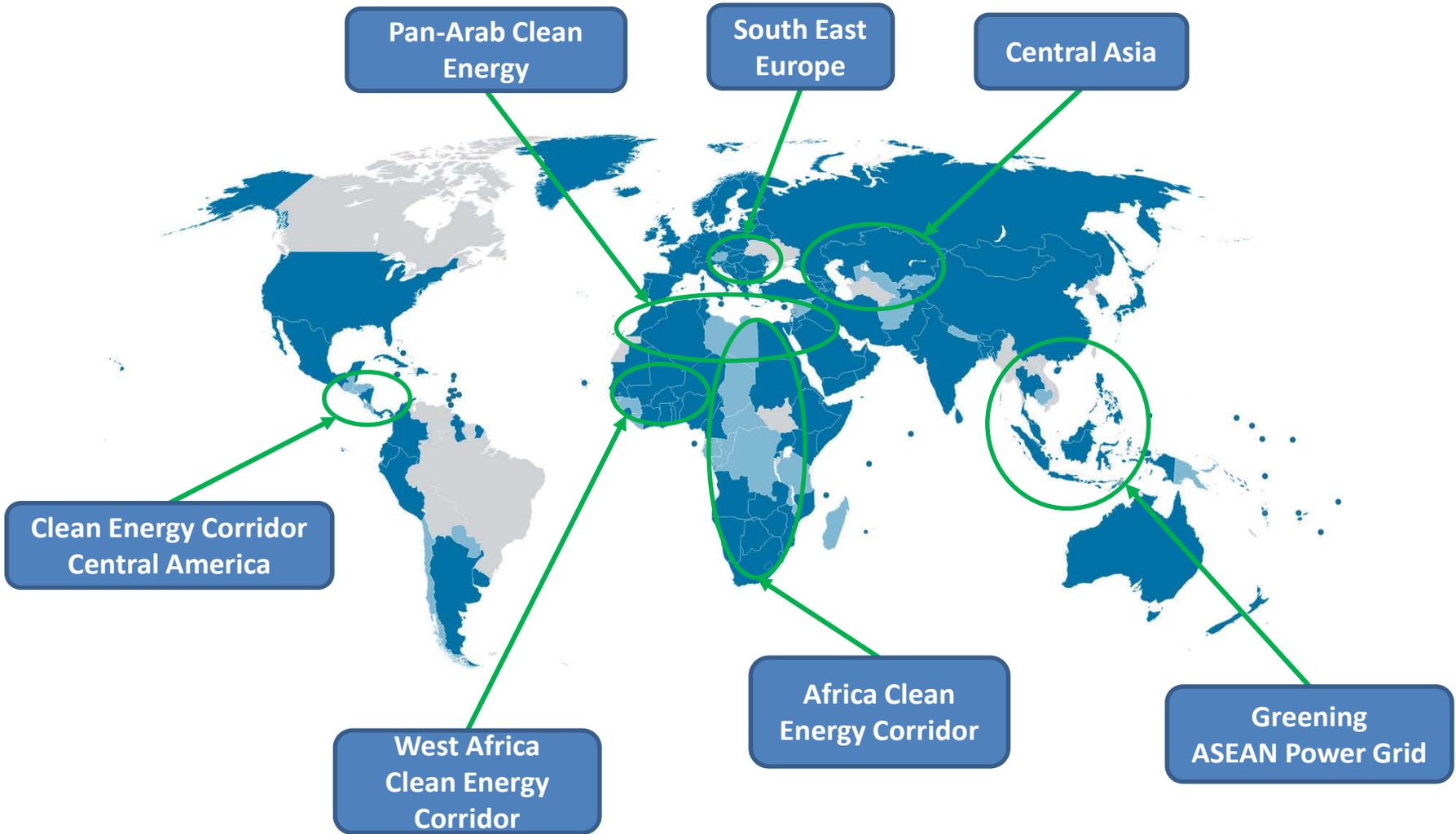


Antigua and Barbuda



Senegal

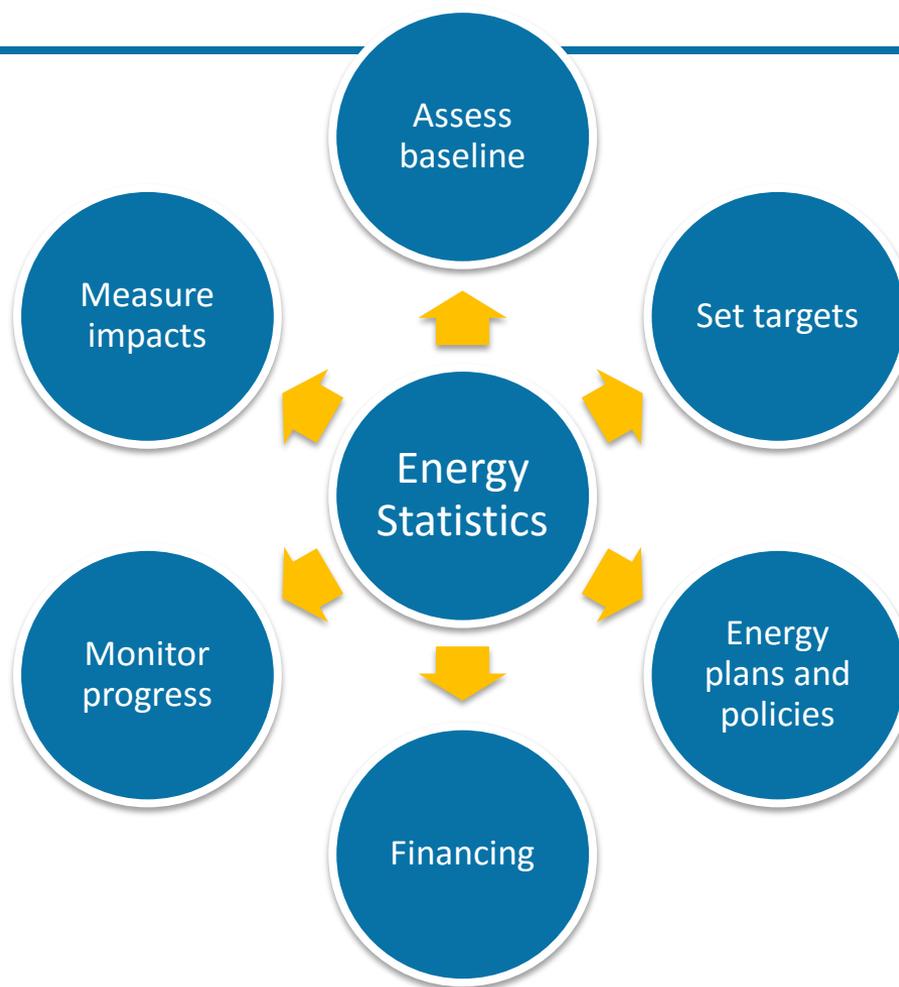
Regional Approach



Central Asia Regional Consultation Meeting Baku, 20 October 2016

Thank you.

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You can't manage what you don't measure!

Capacity	Good Practices
LEGAL AND INSTITUTIONAL FRAMEWORKS	<ul style="list-style-type: none"> • Develop an institutional framework for data collection and reporting that includes: clear division of roles and responsibilities; coordination mechanisms between key institutions; clear processes and timelines; • Adapt statistical acts to incorporate renewable energy statistics.
WELL-DEFINED DATA REQUIREMENTS	<ul style="list-style-type: none"> • Define data needs based on national priorities e.g. monitoring of: RE targets; short term market trends; policies; energy access; energy security etc.
SUFFICIENT SKILLED PERSONNEL	<ul style="list-style-type: none"> • Ensure the lead agency has staff dedicated to the collection of renewable energy data; • Provide renewable energy statistics training for staff and enumerators.
CLEAR METHODOLOGIES AND PROCESSES	<ul style="list-style-type: none"> • Reporting templates should use internationally agreed definitions and measurement units; • There should be a manual showing all calculations and estimation methods used for the production of RE statistics; • Enumerators should be equipped with guidance on how to collect data or make estimates in the field (including pictures and diagrams); • Changes in historical data, data sources, estimates and other adjustments should be recorded in an archive or statistical working system.
APPROPRIATE DATA COLLECTION MECHANISMS	<ul style="list-style-type: none"> • The main instruments for collecting RE data are: household surveys; enterprise surveys and administrative data. Given survey costs, options for using existing data collection activities should be explored before starting new data collection exercise; • Design a sample that takes into account characteristics of renewable energy e.g. regional availability of bioenergy resources.
ANALYSIS, REVIEW AND VALIDATION PROCEDURES	<ul style="list-style-type: none"> • Conduct automated and manual checks to validate data collected (e.g. whether data is complete, internally consistent and realistic); • Data should be peer reviewed prior to publication.
MECHANISMS FOR DATA DISSEMINATION	<ul style="list-style-type: none"> • Data should be made available to the public in an easily accessible format; • Statistics should be published on a regular schedule with minimal time lag.