

Strategic Assessment of the Potential for Renewable Energy in the EBRD Countries of Operation, Stage 1

**USTDA Waste-to-Energy &
Renewable Energy Regional Conference**

09 December 2002

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Black & Veatch**

Agenda

- **Introduction to Black & Veatch**
- **Project Background and Objectives**
- **Renewable Energy Country Profiles**
- **Assessment Methodology**
- **Regulatory Environment**

Black & Veatch: Introduction

- **Global consulting, engineering, and construction firm**
 - **Based in Kansas City, USA**
 - **Over 90 offices worldwide**
 - **7,500 employees**
 - **\$2.4 billion in annual revenues**
- **Specialize in three sectors:
Energy, Water, and Information**
- **One of the Largest Power Plant Design
and Construction Firms in the World**
- **Renewable Energy Services**
 - **About 40 Renewable Energy Staff**
 - **Experience with All Technologies**



- **Study Manager at Black & Veatch**
- **Seven years of experience in renewable energy and advanced technologies**
- **Professional Engineer**
- **Masters Degree in Mechanical Engineering**
- **Working with clients on developing new wind, geothermal, biomass, solar and other types of energy facilities**

EBRD Renewable Energy Project Overview

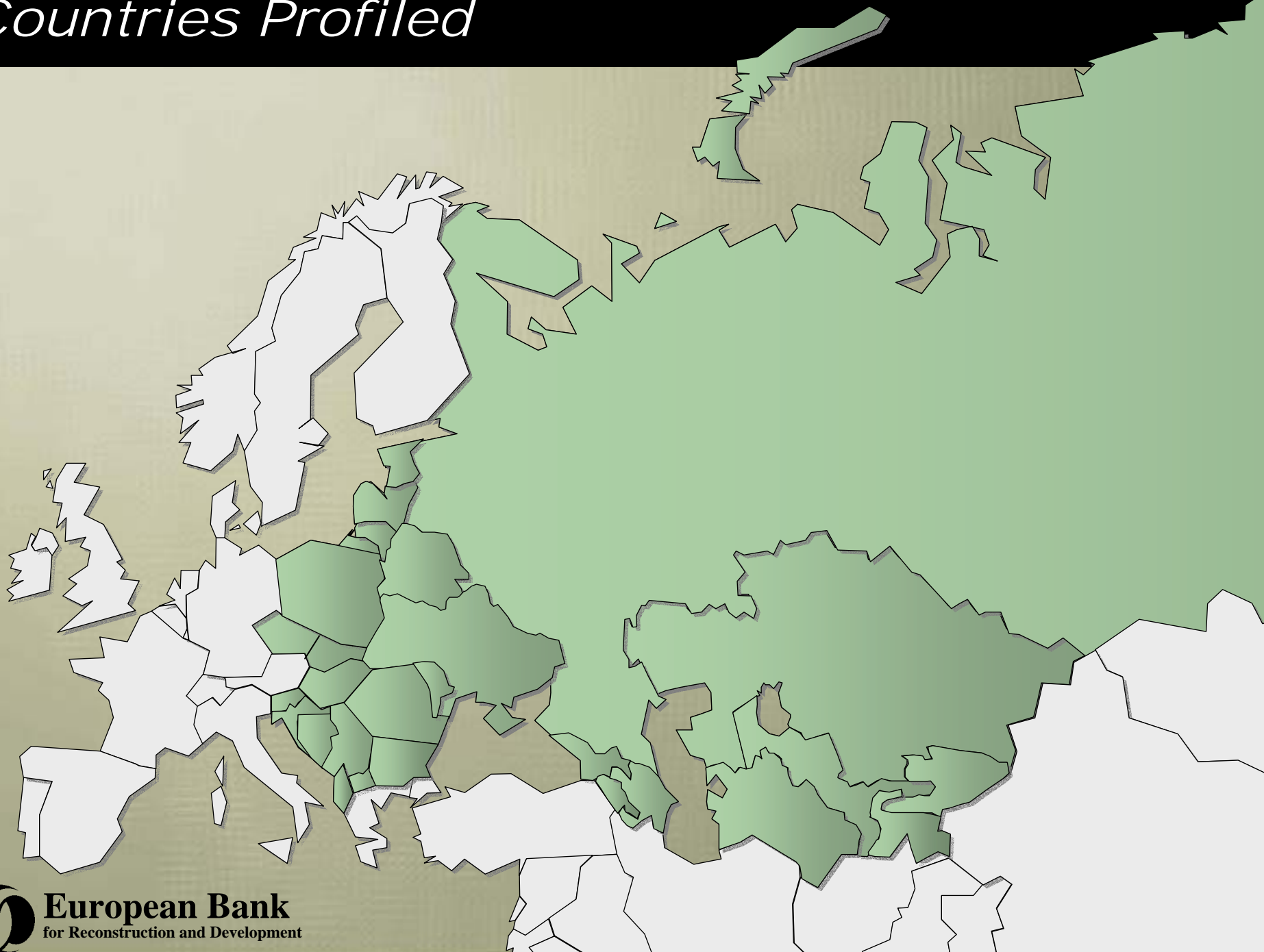
- **Overall objective: identify renewable energy projects for possible EBRD investment**
- **Stage 1 tasks:**
 - **Review status and potential of renewable energy in EBRD countries**
 - **Develop renewable energy country profiles**
 - **Identify initial project ideas**
- **Desk Study – collect and assimilate available information**
- **Schedule: May to December 2002**
- **Seven regional specialty subcontractors**

Subcontractors



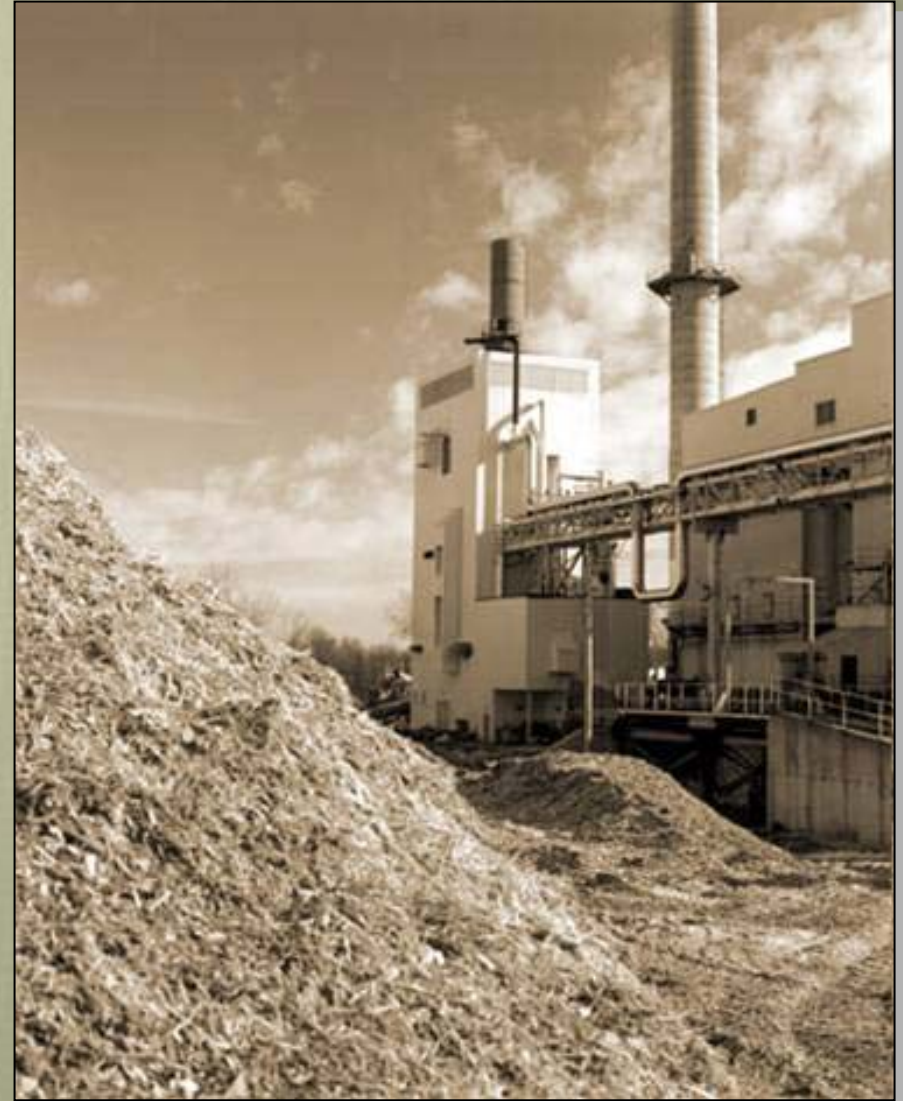
- **Arges Enerji Systems, SEDA, TUBITAK**
- **Institute of Power Studies and Design (ISPE)**
- **Istroenergo Group A.S. (IEG)**
- **Interwind**
- **NV Consultants**
- **Hydroproject**
- **ENIN -- Krzhizhanovsky Power Engineering Institute**

Countries Profiled



Renewable Resources Investigated

- **Wind**
- **Solar**
- **Biomass (excluding municipal solid waste)**
- **Geothermal**
- **Small to medium hydro**



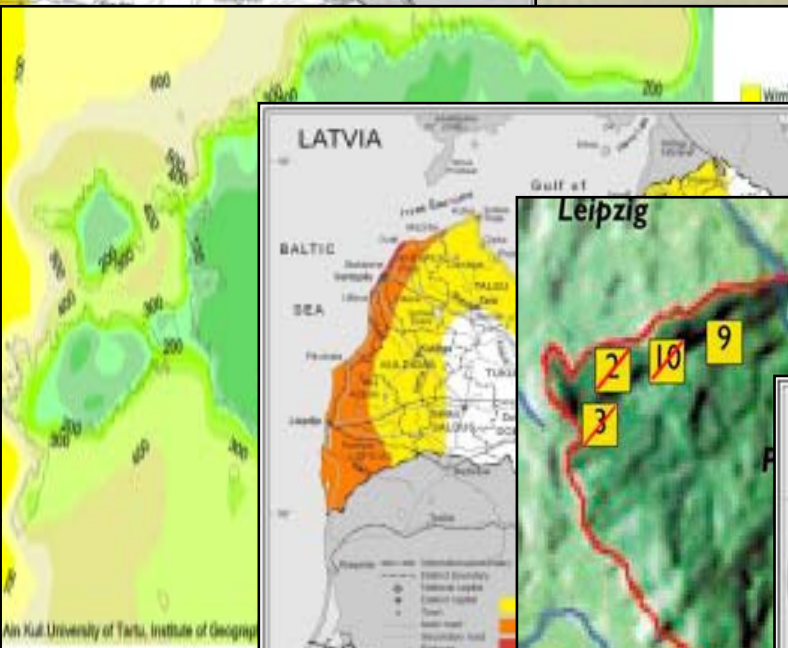
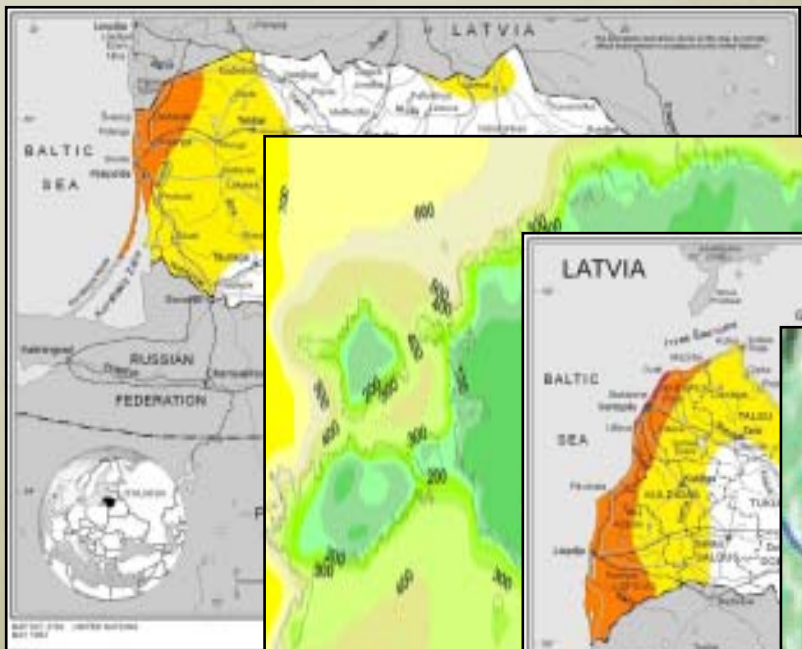
Summary of Project Progress

- **Country Profiles**
 - **27 of 27 Countries Rough Draft Form**
 - **550+ Pages**
 - **Currently Revising for Final Report**
- **Project Opportunities Identified**
 - **2000+ High Potential Areas, Strategic Studies, and Specific Projects Identified**
 - **Currently Preparing Project Shortlist**
- **Project Website Development**

Renewable Energy Country Profiles

- **Prepared for each country**
- **Information for the five resources:**
 - **Current Status**
 - **Overall Resource Potential**
 - **Identification of Areas / Projects with High Technical Potential**
 - **Barriers and Incentives for Development**
- **Tremendous amount of data, maps, and information resources**

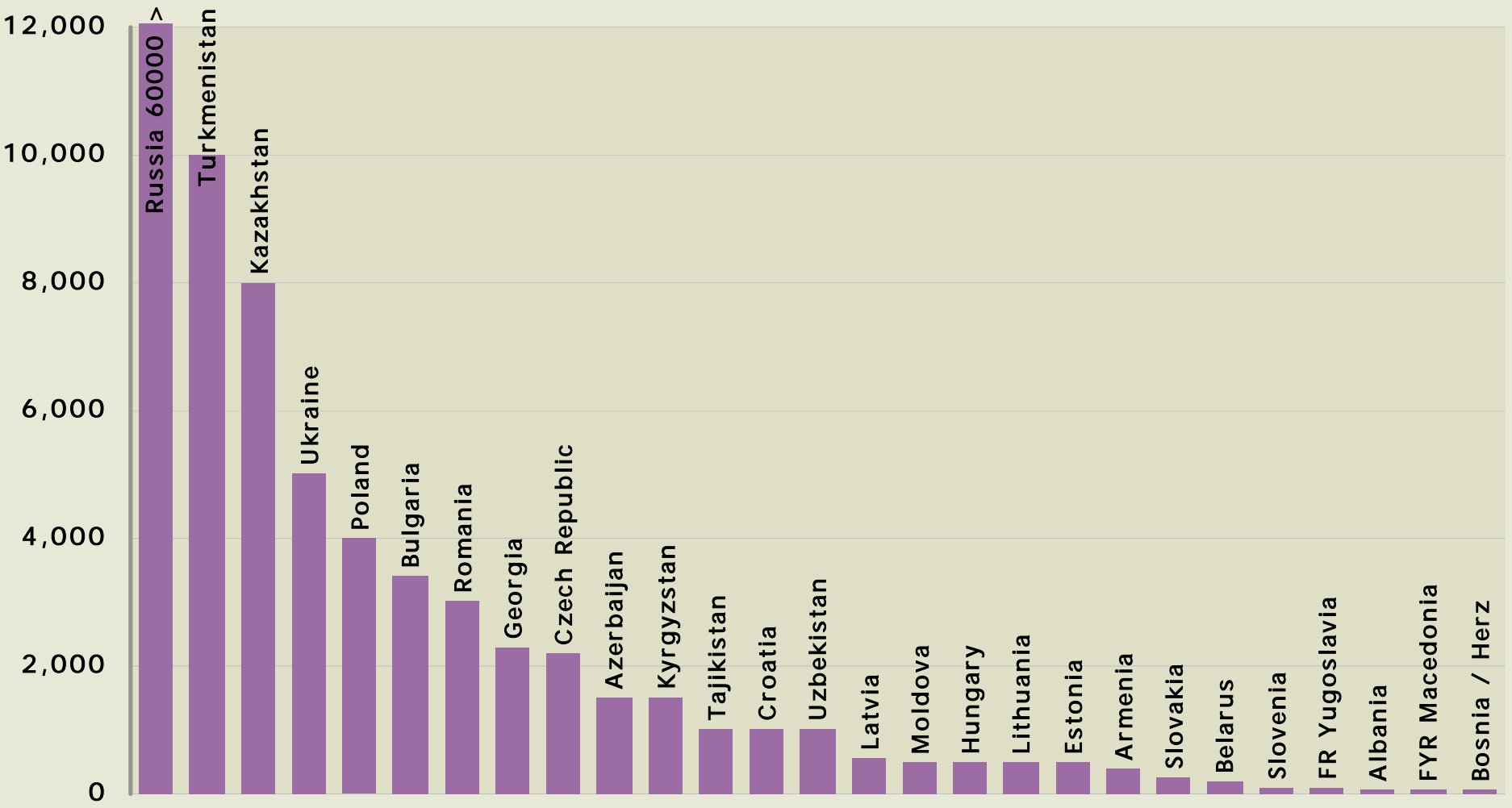
Renewable Energy Country Profiles



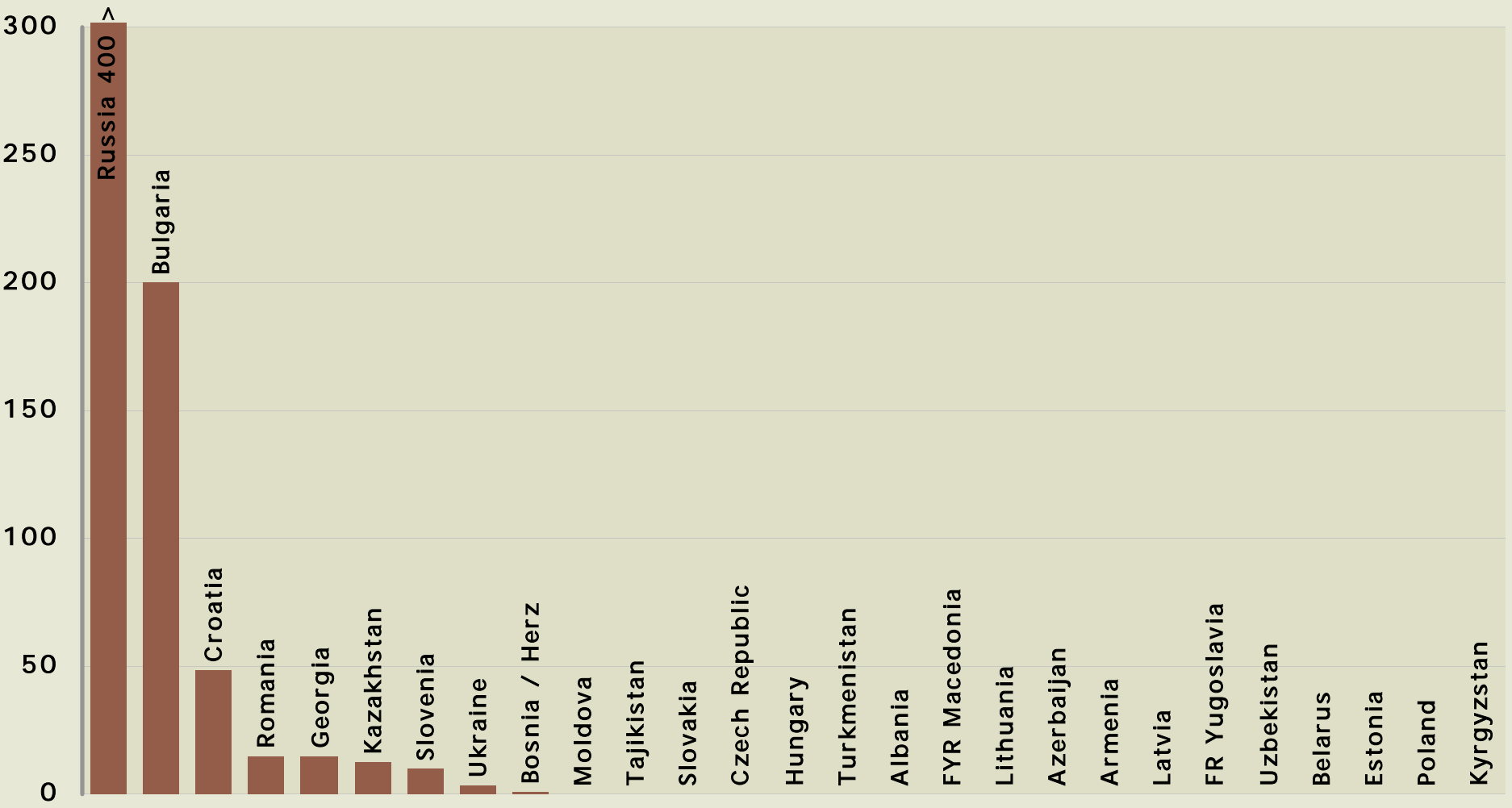
Current Installed and In-Construction Capacity

	Wind MWe	Solar MWe	Geothermal MWth	Biomass MWth	Hydro MWe
Czech Republic	23.0	0.01	13	7	283
Estonia	6.2	0.05	0	775	4.3
Hungary	2.8	0.01	350	N/A	43.8
Latvia	22.8	0	0	N/A	64.5
Lithuania	0.0	0	21	70	112
Poland	68.0	0	69	N/A	790
Slovakia	0.0	0	132	N/A	684
Slovenia	0.0	0.05	42	88	520

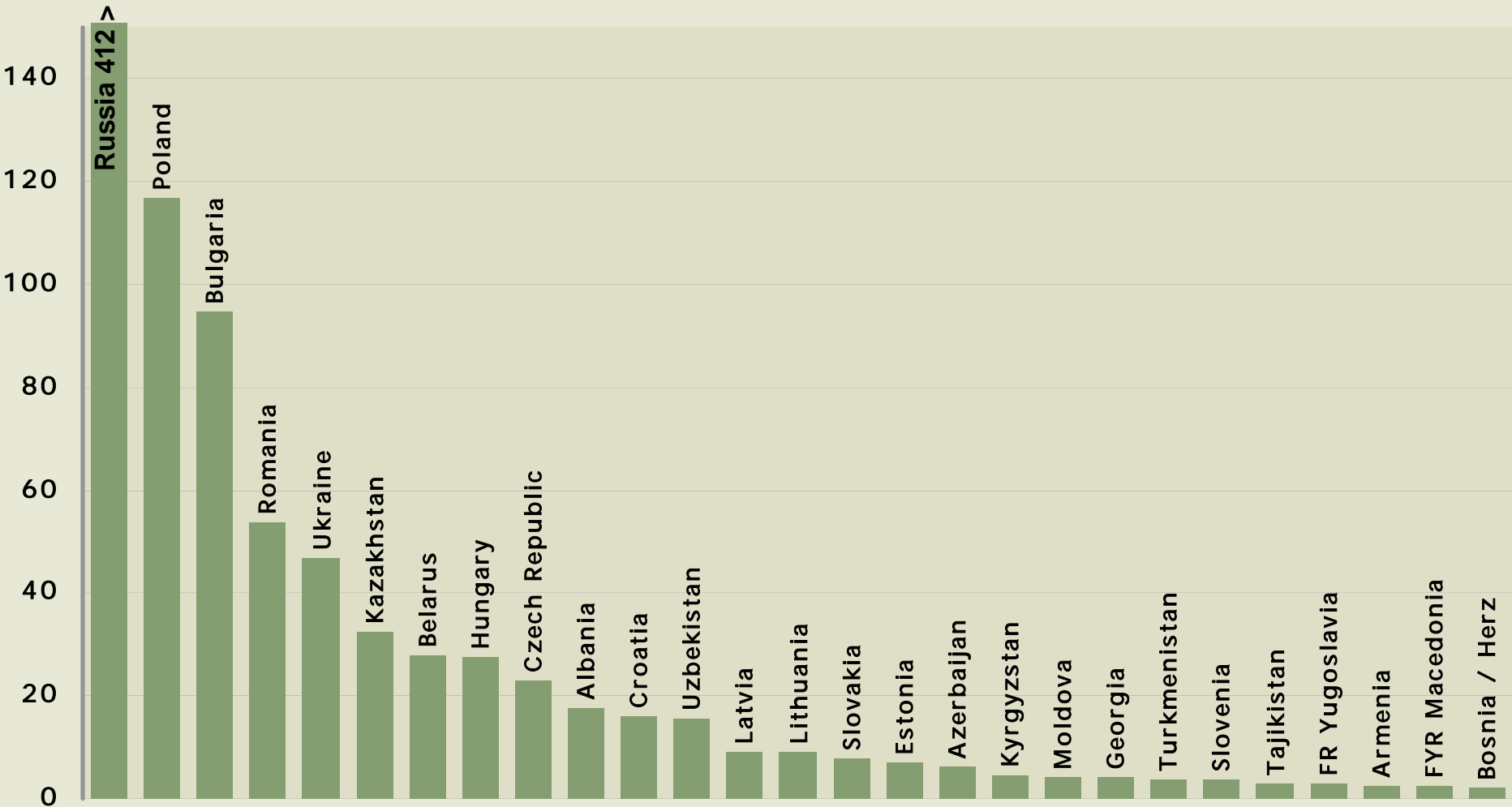
Wind Technical Potential (MWe) by 2020



Geothermal Technical Potential (MWe) by 2020



Biomass Technical Potential (TWh_{th}) by 2020



Assessment Methodology Approach

- **Country Assessment** for each of the 27 countries
- **Resource Assessment** for each resource (wind, biomass, etc.) for each country (135 total)
- **Project Assessment** for each of the identified projects



Assessment Methodology Criteria

■ Country Assessment Criteria

- Foreign direct investment per capita
- EBRD average transition indicator
- EBRD electric transition indicator
- Electricity tariff
- EU accession status
- Availability of financing
- Renewable barriers and incentives

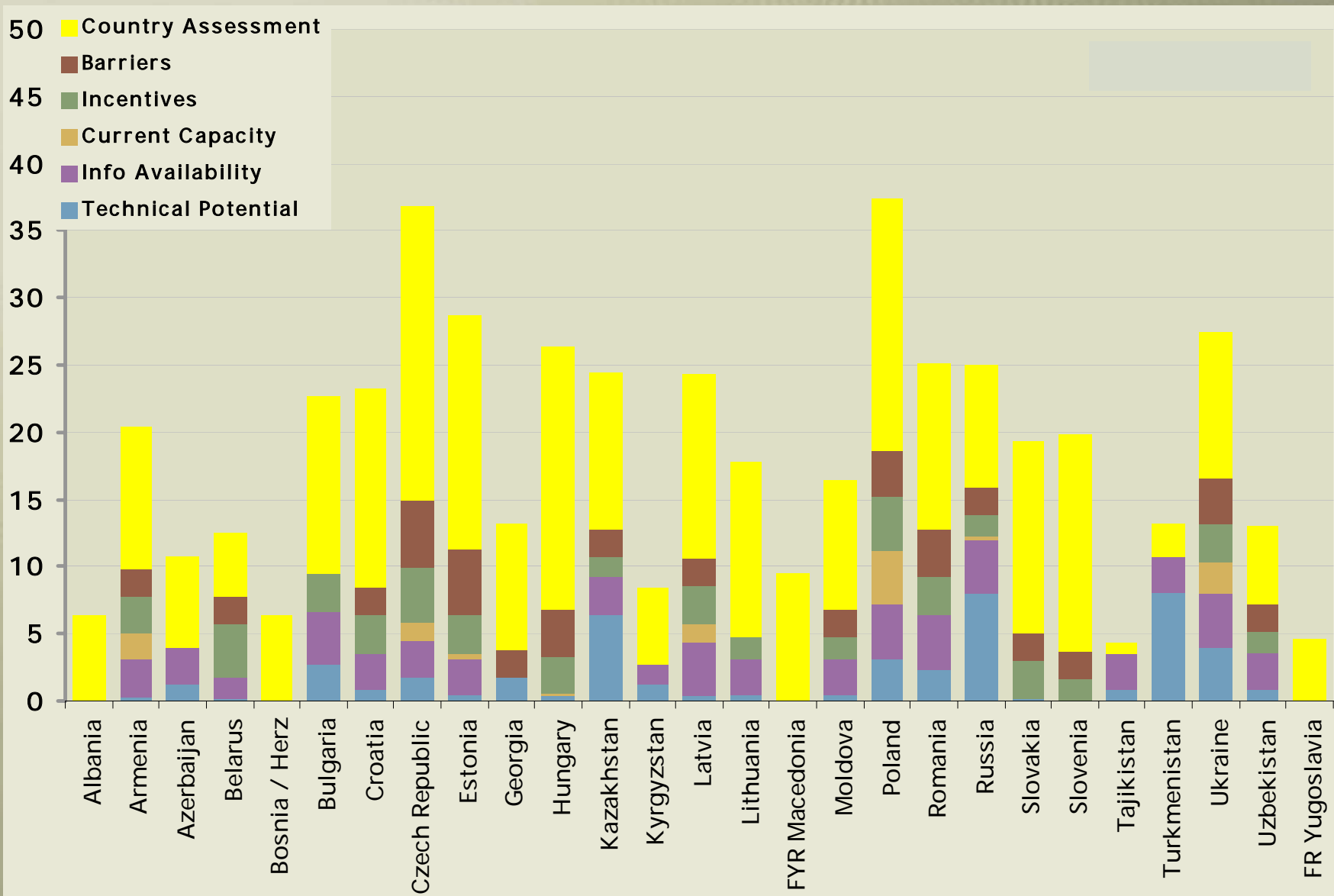
■ Resource Assessment Criteria

- Level of information availability
- Installed / under construction capacity
- Estimated technical potential
- Incentives
- Barriers

■ Project Assessment Criteria

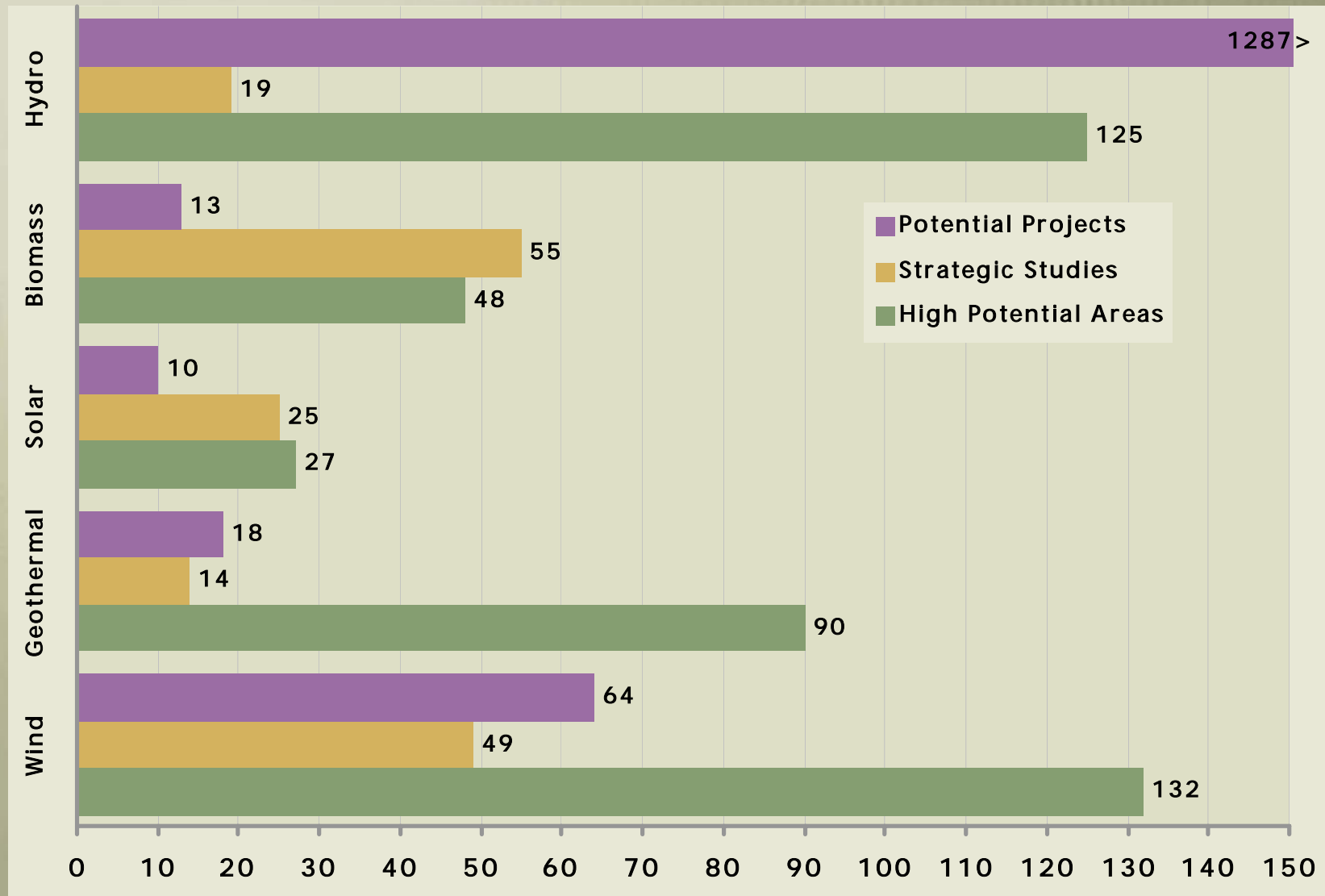
- Estimated capital cost of project
- Financial viability (profitability)
- Overall environmental impact
- Overall socioeconomic impact
- Use of commercial technology
- Access to sufficient transmission
- Project status
- Developer capability
- Foreign investment interest
- Timeliness
- Replicability

Example Resource Assessment (Wind)

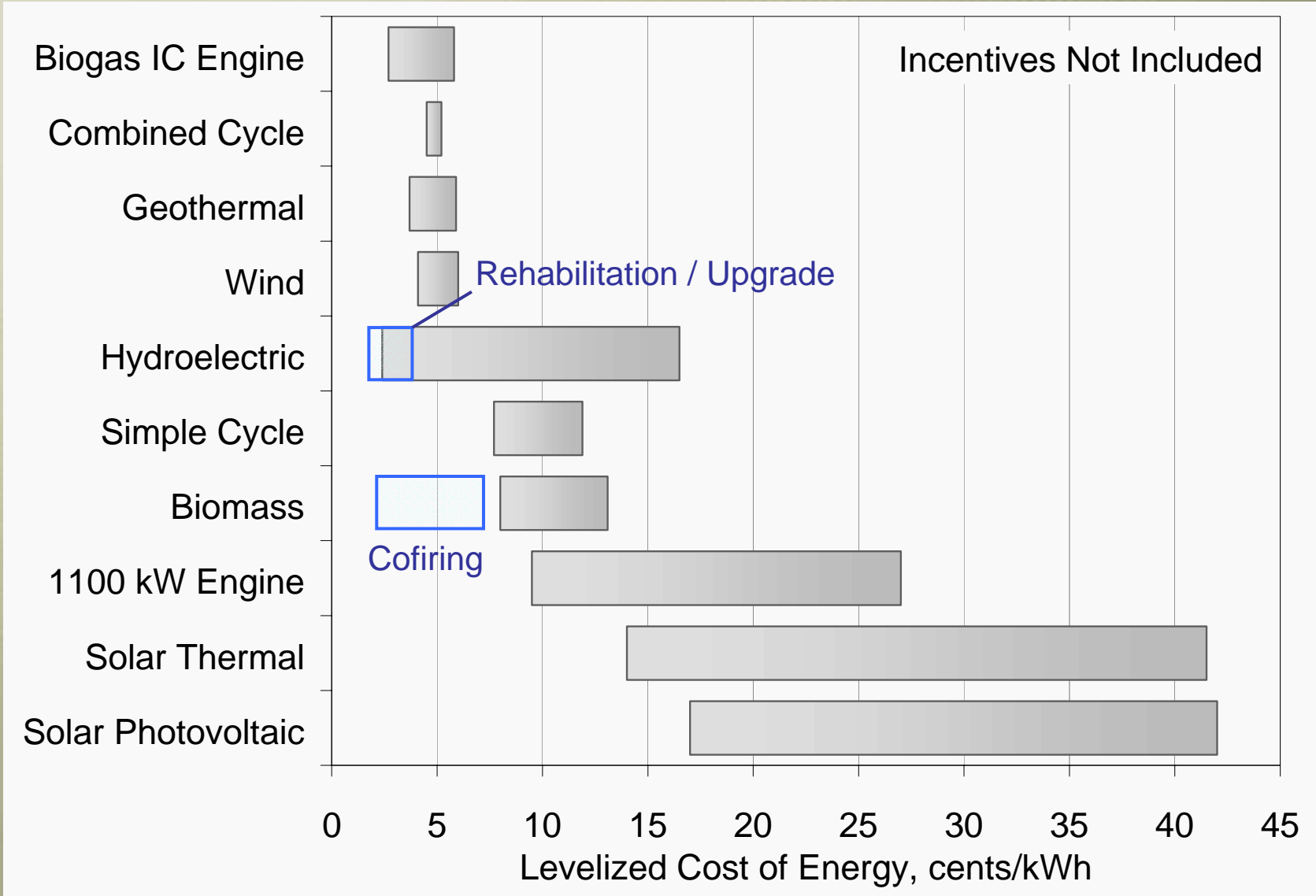


- **Project Opportunities Identified**
 - **422 High Potential Areas**
 - **162 Strategic Studies**
 - **1,400+ Specific Projects (138 excluding hydro)**

Project, Area, and Study Opportunities by Resource



Critical Barrier: Higher Cost of RE



- **Renewable Energy Regulations on Many Levels**
 - **International Agreements**
 - **National Policies**
 - **Local Policies**
- **Various Types of Market Assists for Renewables:**
 - **Feed-In Tariffs**
 - **Renewable Portfolio Mandates**
 - **Public Benefits Fund**
 - **Tax Credits, Net Metering, Green Pricing, Disclosure, Carbon Trading, etc.**

Key Incentives

Key Incentives -- Feed-In Tariffs, US cent/kWh (Wind example)

Czech Republic	9
Estonia	4.8
Hungary	7 to 8
Latvia	5, for 8 years, 2.5 thereafter
Lithuania	N/A
Poland	4.2 to 9
Slovakia	N/A
Slovenia	N/A

See Project Website For Latest Updates

- <http://projects.bv.com/ebrd>

Strategic Renewable Energy Assessment
Central & Eastern Europe
Former Soviet Union

Project Overview
News / Announcements
Project Publications
Renewable Energy Country Profiles
Sponsors & Developers
Partners
Project Contacts

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Conclusions and Acknowledgements

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