



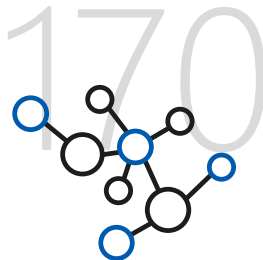
FICHTNER

Company Presentation of the Fichtner Group

ADB Business Opportunities Seminars on Clean Tech for Energy and Mobility
10 November 2021



Established in 1922 and
family-owned ever since



Project experience in
more than 170 countries



Total turnover of
€226 million in 2020



1780 employees
worldwide – over 800 of
these in our home office



Long-standing employees
from 66 nations



>60m€ turnover in more
than 90 projects with ADB

Renewable Energies

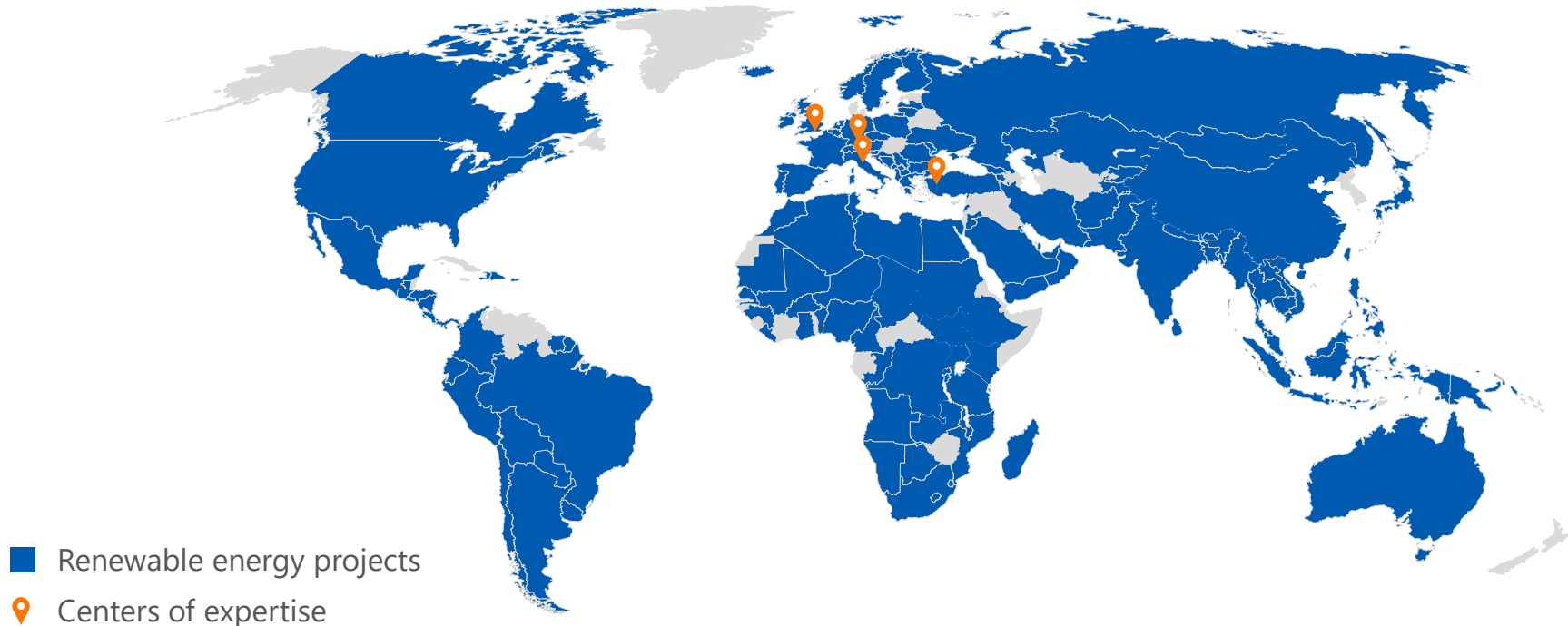
Experience – Overview



Centers of expertise in Germany, Italy, UK, Turkey

Fichtner supported renewable energy projects with a total capacity of more than 160 GW, thereof:

- 500 hydropower projects
- 700 wind energy projects
- 500 PV projects
- 140 solar thermal projects
- 250 biomass projects
- 55 biogas projects
- 40 geothermal energy projects
- 50 hybrid system projects



Project Description

National renewable energy master plan for Bhutan



TA-Name:	TA 8630-BHU: Promoting Clean Energy Development in Bhutan
Project Duration:	29 months
Contract Value:	1,300,000 USD
Total person-months:	66 MM



Background and Rationale

To encounter the threads of climate change on energy supply, diversification of the energy supply on the basis of renewable energies is a common strategy

Background

- Bhutan is rich of renewable energy sources (fast flowing large rivers, high solar irradiation, valley wind systems, about 70% of the land covered by forest)
- Country mainly relied on one single source for electricity generation, which is hydropower




Driving Force and Rationale

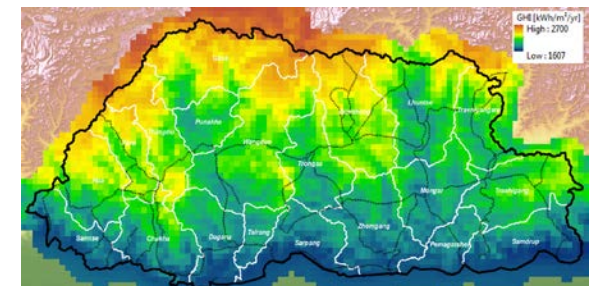
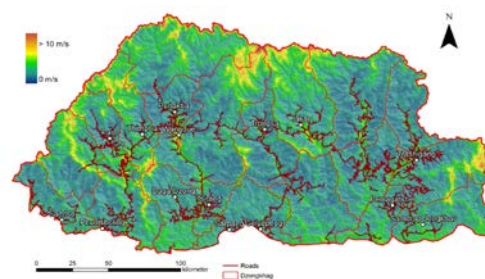
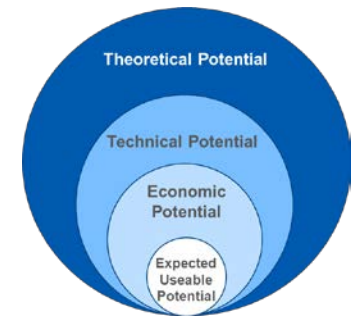
- Climate change might result in different future precipitation patterns and endanger the current power generation in the country
- Climate change supports the development of renewable energies worldwide
- Diversification reduces the respective risk and enhance security of supply



Scope of Work

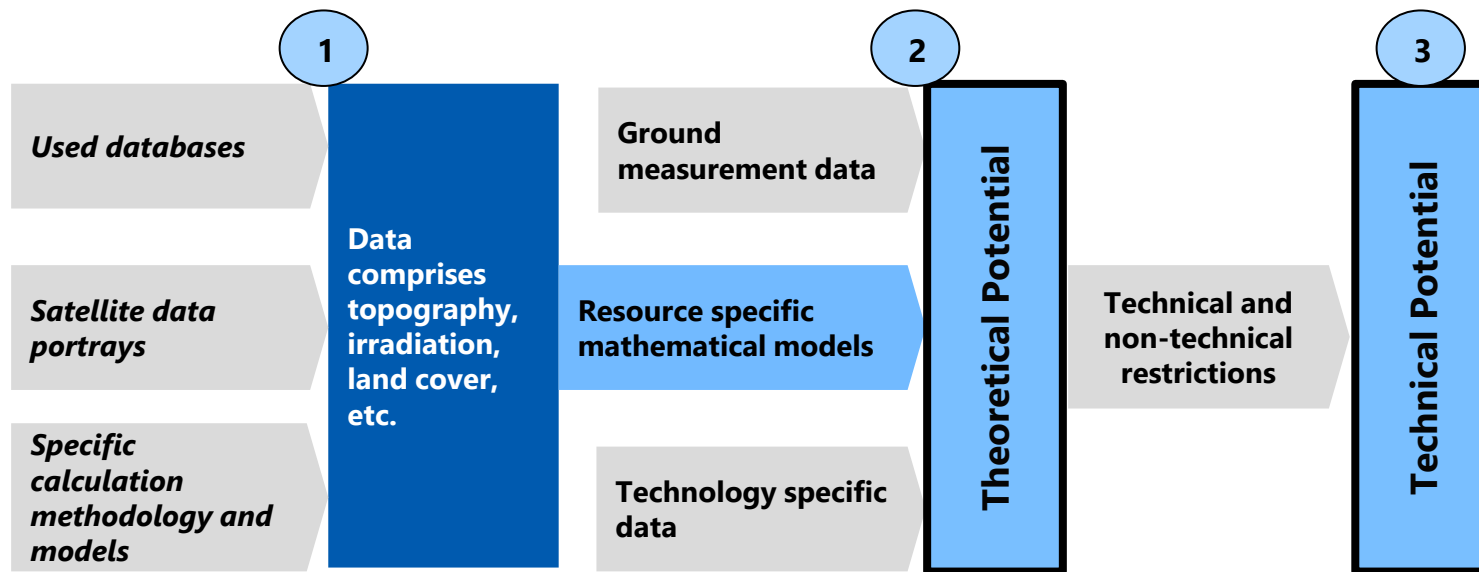
Renewable Energy Resource Assessment: before making use of it, know the resources

- The Renewable Energy Resource Assessment is a precondition for the development of the Renewable Energy Masterplan
 - A Renewable Energy Resource Assessment is carried out to estimate the potentials
 - The resources covered by the Resource Assessment are:
 - Hydropower,
 - Wind energy,
 - Solar energy,
 - Biomass
 - The Resource Assessment estimates the theoretical and the technical potential
 - Specific sites and development areas for different renewable energies are covered by the RE Masterplan
- 
- The diagram illustrates the hierarchy of renewable energy potentials. It consists of four concentric circles, each representing a different level of potential. The outermost circle is dark blue and labeled 'Theoretical Potential'. The next circle inward is a lighter blue and labeled 'Technical Potential'. The third circle is a very light blue and labeled 'Economic Potential'. The innermost circle is white with a blue border and labeled 'Expected Usable Potential'. The circles are arranged in a way that suggests a funneling process from the theoretical to the expected usable potential.



Methodology to determine the Renewable Energy Potential

Three steps for determining the technical potential for the different technologies in Bhutan



- Step 1: Description of used databases and specific calculation methods
- Step 2: Calculation of theoretical potential
- Step 3: Resource specific technical potential derived from the theoretical potential by considering restrictions

Determination of Technical Potential

The restrictions / limitations applied vary from RE resource to RE resource

Terrain Restrictions

- Elevation level, slope, orientation

Infrastructural Criteria

- Distance to existing infrastructure (roads, settlements)

Social and Environmental Parameters

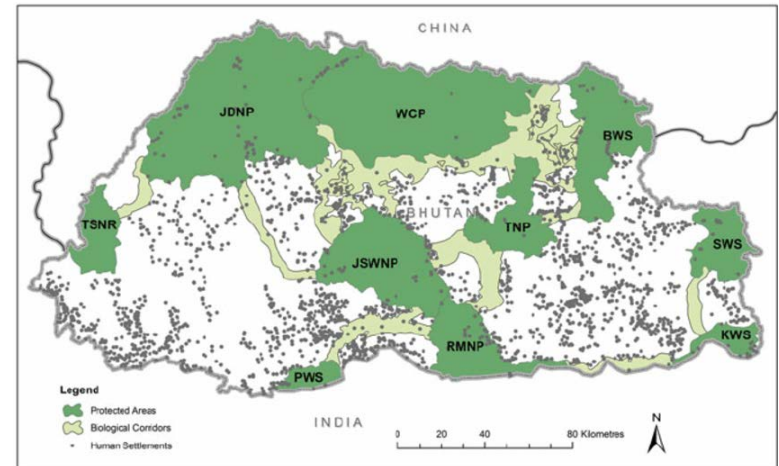
- Protected areas, agricultural land, forest, national parks, etc.

Technology and other Parameters

- Technology available for Bhutan, road curves, alternative use, etc.



The restrictions / limitations are applied to the theoretical potential



Shingkar PV Plant: Public consultation at Shingkar village, Ura Gewog, Bumthang district, 8 July 2015



Public consultation at Shingkar village, 8 July 2015

Experience with ADB

Financing and type of tenders

Grant Projects / Technical Assistance (TA)

- Grant Projects are usually tendered by the Executing Agencies (EA) in the countries (published and evaluated through ADB's tendering platform (CMS))
- TA projects are funded by ADB itself – ADB is the client

Loan projects / Implementation projects

- Services are tendered by EA based on the Loan Agreement concluded between ADB and EA
- Loan projects are awarded by the EA
- ADB gives no-objection to the evaluation results and the contract

Offer types

- Quality- and Cost-Based Selection (QCBS) – most common form of tender (T/F: 80/20 or 90/10)
- Quality-Based Selection (QBS) – only technical offer evaluated
- Fixed Budget Selection (FBS) – contract to bidder with the best technical offer within budget
- Least-Cost Selection (LCS) – the lowest bidder among the qualified bids is awarded

Experience with ADB

Executing projects with ADB

Lump Sum Contract

- Accounting according to milestones

Time Based Contract

- Billing according to effort within the individual budget sums as highlighted in Time & Manning Schedule
- Billing of services according to monthly time sheets
- Home office based on 22 working days = 176 hours per month
- On-site services based on "days in country plus negotiated travel days" at 30 calendar days per month

Summary

- Standardized contracts
- Financing for payments backed by ADB or directly paid
- Processes are quite formalistic but transparent
- ADB expects comprehensive and high-quality services
- You might have to deal with "two clients"





Fichtner – Shaping the future together

INDEPENDENT

We are an owner-managed family business that has maintained its independence in order to seek objective and customer-oriented solutions.

COMPETENT

Highly qualified employees, decades of experience and a comprehensive quality management ensure project success.

INTERNATIONAL

Thanks to the global nature of the Fichtner group with its worldwide network, projects can be handled close to the customer.



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