



UNIDO ITPO, Italy

LINKING BOTSWANA AND ITALIAN SOLAR SECTOR



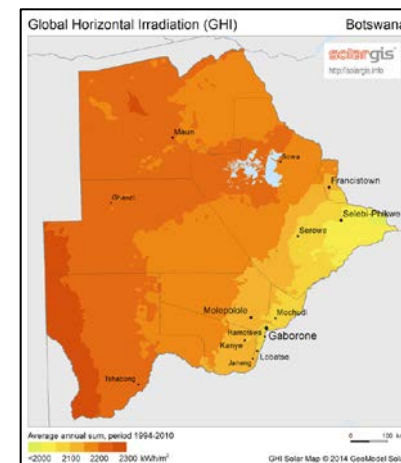
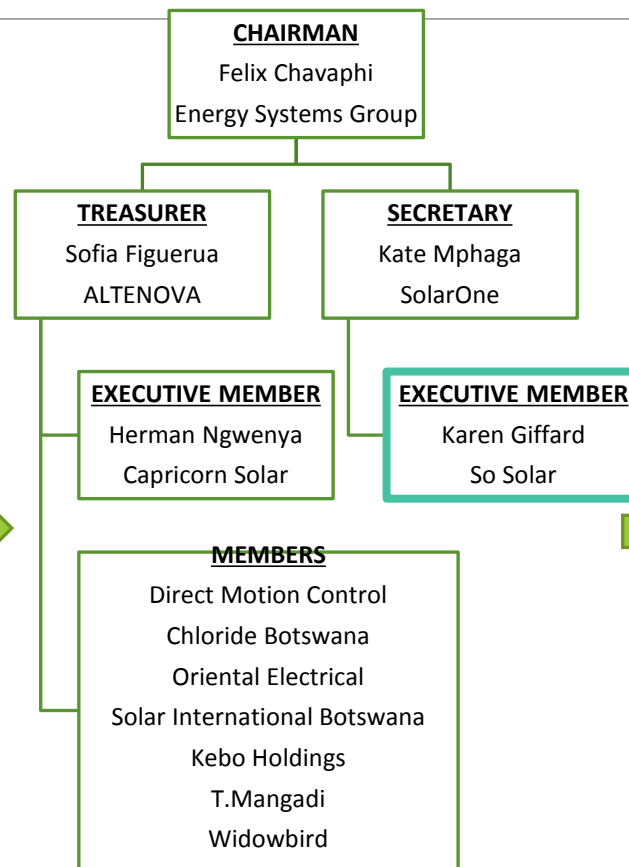
BY KAREN GIFFARD



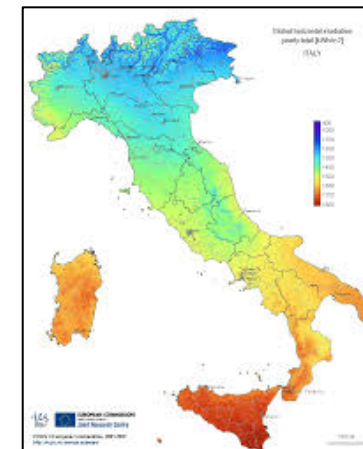
Approach



Visit as many Solar companies as possible in Italy



Botswana Solar Sector, Objectives and Projects



Italian Solar Sector, Company overview and Solutions



Presented Objectives & Projects

Categories	Status	Objectives	Projects
Photovoltaic	x	None	100MW EOI – BPC & Ministry of Minerals, Green technology and Energy Security Mini-grids – Government of Botswana
Off-Grid PV	x	Off grid system solutions (including 300W – 50KW) Pumping including DC pump options and Variable Speed Drive	Mokolodi Solar thermal & Borehole installation Solar Borehole Pumping Joint venture Pico systems – World Bank (Off-Grid Strategy)
Storage solution	x	Storage solutions (Li-ion or latest technology)	Li-ion and Inverter technology supply
CSP technology	x	Concentrated PV and CSP technologies Solar thermal commercial and residential water heating	Solar in ‘Eco-Farming’ Solar thermal roll out – Ministry of Minerals, green technology and energy security 100MW EOI – BPC & Ministry of Minerals, Green technology and Energy Security
Research & Development	x	Solar hybrid options (thermal and photovoltaic combined)	Assembly of Hybrid PV and thermal
Associations & Financial	x	Structure of Private associations or consortiums in Green energy Other institutions: Financial and RE in general	Botswana Solar Database
Testing Facility	x	Certification of Renewable Energy Technologies	None



Introducing the Italian Sector

PHOTOVOLTAIC

RESEARCH

TESTING

ASSOCIATION & FINANCE

STORAGE

THERMAL





Photovoltaic

- ☐ 15% emission reduction target
- ☐ Energy Mix for energy security
- ☐ 100MW Expression of Interest

Companies that can deliver large utility scale projects and mini-grid solutions from design through to implementation and open to local partnership.

Tailor-made inverter solutions to be used on and off-grid ranging from 1kW based with potential for up to five varying fuel sources,

Botswana Can Benefit:

1. From the experience of companies with a history of delivering utility scale projects to meet EOIs
2. Versatility of tailormade solutions for mini-grid, grid integration and grid stability for better energy mix.





Off-Grid Photovoltaic Solutions

- ❑ Limited grid access in rural areas
- ❑ Focus on Agricultural development with incentives for underground water pumping
- ❑ Promotion of Eco Lodges



Innovative pico system solutions, VSD water pumping solution with firmware, off grid shop and supply chain to assemble products with design support was sourced

Botswana could Benefit:

1. Pico system model match Off-grid strategy to improve rural access.
2. Underground water pumping relevant for agriculture.
3. Innovative hybrid solutions applicable for various sites. Including mini-grid EOI for rural access.





Storage Solutions

- ☐ Latest technology requests
- ☐ Better technology for harsh conditions

Two types of latest technology sourced:
Lithium-ion and Sodium Nickel

Botswana can benefit:

1. Sodium Nickel technology is robust operates well in high temperatures which is relevant for Botswana Off-grid applications , FZSoNick
2. Lithium Ion technology is small in size but can be volatile so most relevant in Botswana high end applications with cooling systems, FAAM
3. Lead Acid technology is still relevant in the market as a lower cost solution as well as focusing on improve efficiency and recycling.





Solar Thermal Solutions

- ❑ 100MW CSP
- ❑ Solar thermal roadmap.

Four types of technologies were discovered during the tour including Fresnel, parabolic CSP, combined concentrated pv and latest short tower CSP.

With varying thermal fluid including salt, water and oil but also an innovative storage solution of sand rather than salt as commonly used .



Botswana can benefit:

1. Different thermal technologies for industrial/commercial heating and cooling systems as well as large scale electricity generation and agricultural green house applications. Unfortunately a residential solution was not identified due to cost implications.





Research & Development



- ☐ Develop technology relevant to the region and suitable to the environment
- ☐ Job creation and economic sustainability in the country

Discovery of not only innovative solutions to problems but a bottom up approach to solve real issues to eventually deliver to market and stimulate economic growth.

Cutting edge technology requires multidisciplinary interaction to reach the point of global recognition.

Botswana could benefit:

1. By adopting a similar approach to innovation through models such as 'Live Lab' could stimulate development of local products and job creation.
2. Utilise or test new technologies in different climate/environment for research purposes.





Certification & Testing



- ☐ Quality performance issues in market including failed projects
- ☐ Better sector control
- ☐ Plans to develop solar test facilities

The company has experience in both solar technologies but focuses on photovoltaic testing due to thermal not being prominent in the market, following IEC standards with additional regional tests, **Albarubens**



Botswana has plans to develop test bed facilities and can benefit from the expertise, in-house build and design of laboratory equipment and also localised specialised tests developed for extreme conditions not included in IEC





Associations & Financial

- ☐ Create support & cohesion in the industry
- ☐ Enhance opportunities and provide stable platform for investment



Understand that there is financial support for available for Italian companies wanting to invest in foreign countries, **SIMEST**

Botswana would be considered for financial support from SIMEST, making it a country Italians are more likely to consider investing.



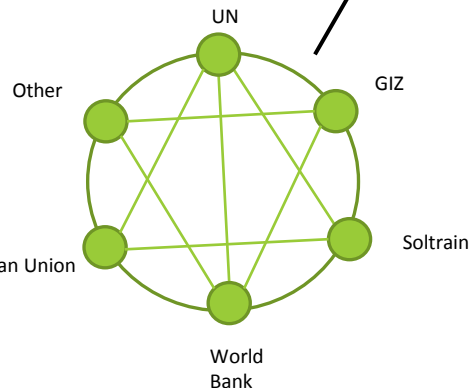
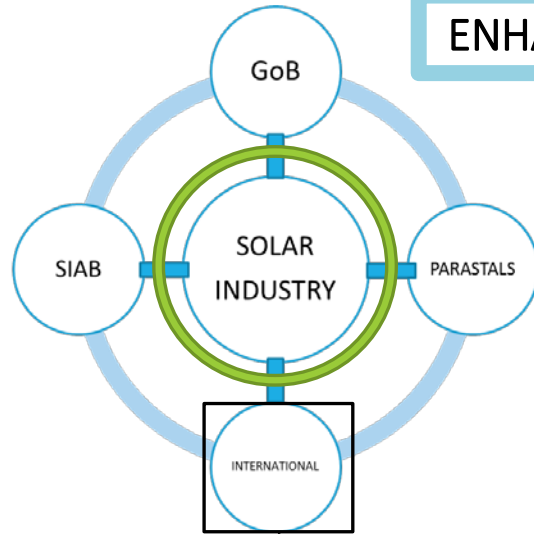
Innovative association strategies & proposals driving economic and market development in the targeted countries. Would consider a project in Botswana & advising on SIAB structure.

Support country framework development and training to enable local sector growth and also provide advice to strengthen the solar association in Botswana including how to finance administration to strengthen advocating for solar



Messages to take back to Botswana

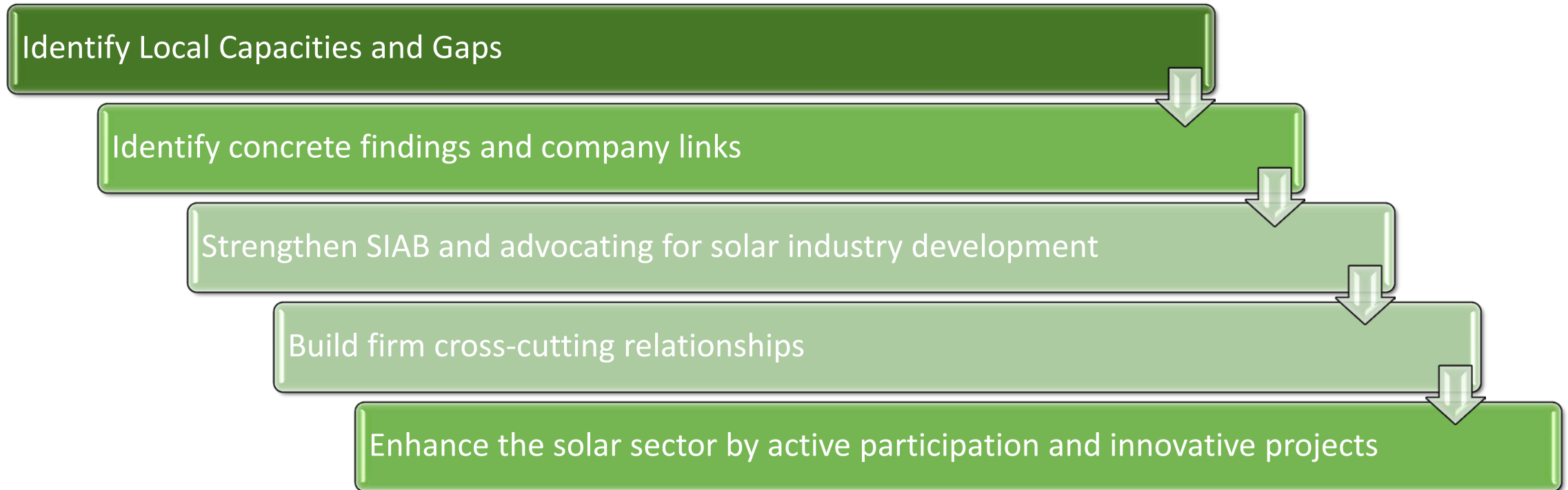
ENHANCING THE UPTAKE OF SOLAR TECHNOLOGIES IN BOTSWANA IN A SUSTAINABLE WAY .



- ❑ We have more capacities than we acknowledge but its important to fully understand those capacities and bridge gaps with international capacities.
- ❑ Focused bottom up approach can change the dynamics of creativity and willingness to deliver results. Implementation rather than Administrative should be the focus.
- ❑ Holistic, sustainable, uniquely local approach will ensure longevity and a creation of a unique identity to enhance economic development.
- ❑ It is important to collaborate between sectors, projects, institutions and disciplines



Next Steps



THANK YOU

