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SOLAR THERMAL ROADMAP AND IMPLEMENTATION PLAN: From Start to current: Case study Zimbabwe

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Outline



- Introduction
- Policies in Zimbabwe
- Methodology for Roadmap Development
- Roadmap Developed
- Milestones attained and Activities in Support of Roadmap and Implementation plan



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Why Solar thermal for Zimbabwe?

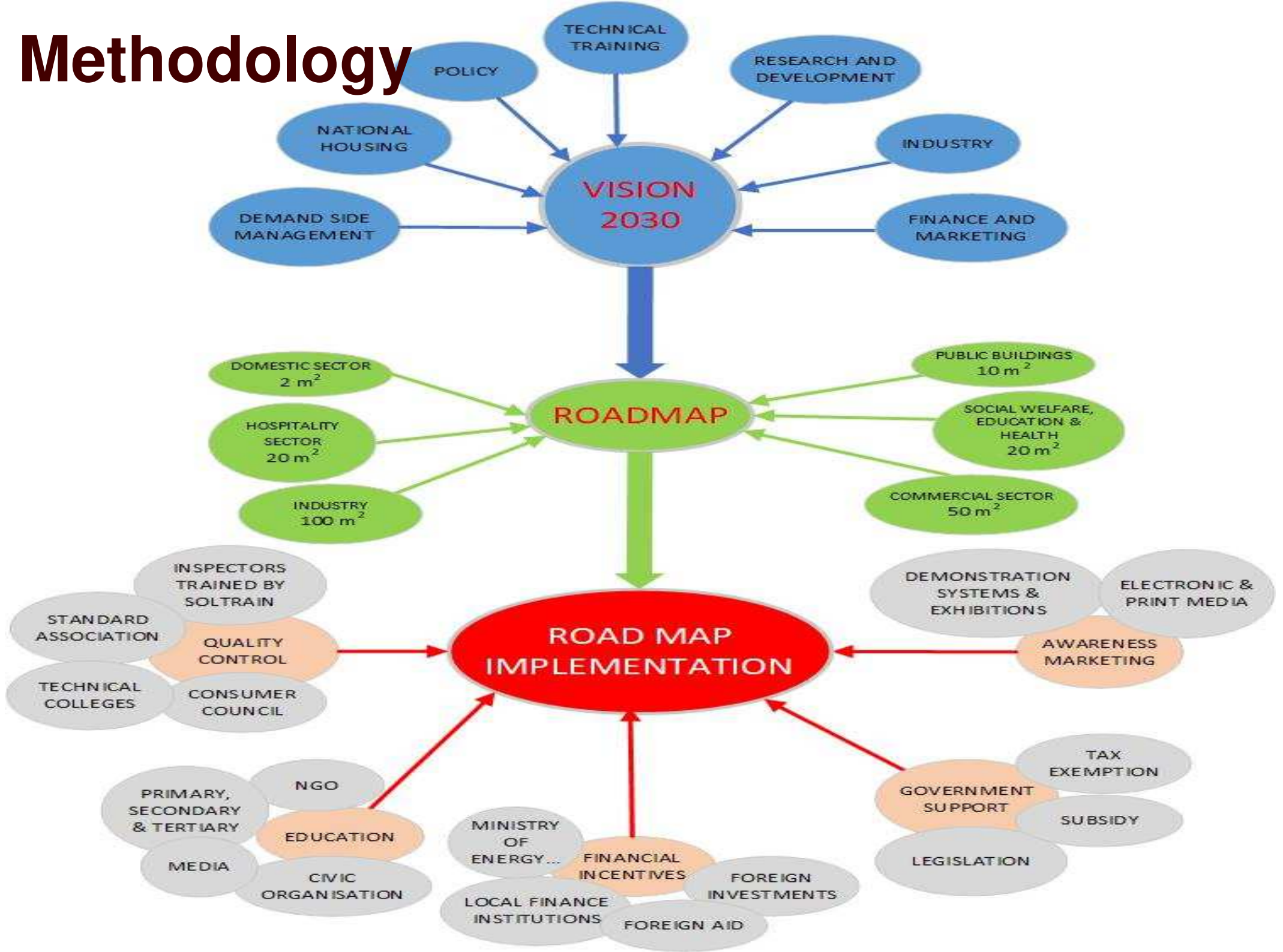


1. Zimbabwe has a peak demand of about 1700MW against internal generation of about 1200-1500MW
2. The power shortfall is addressed through imports from Mozambique and South Africa
3. The Electrification access rate is 44% with access at more than 85% in urban areas and less than 20% in rural areas
4. The existing main power station (Hwange) and small thermal power stations (Bulawayo, Munyati, and Harare) operate way below capacity due to old equipment and inadequate O&M practices
5. Need to Address Energy Poverty
6. About 40 % of the energy is used for heating

Huge scope for solar thermal uptake

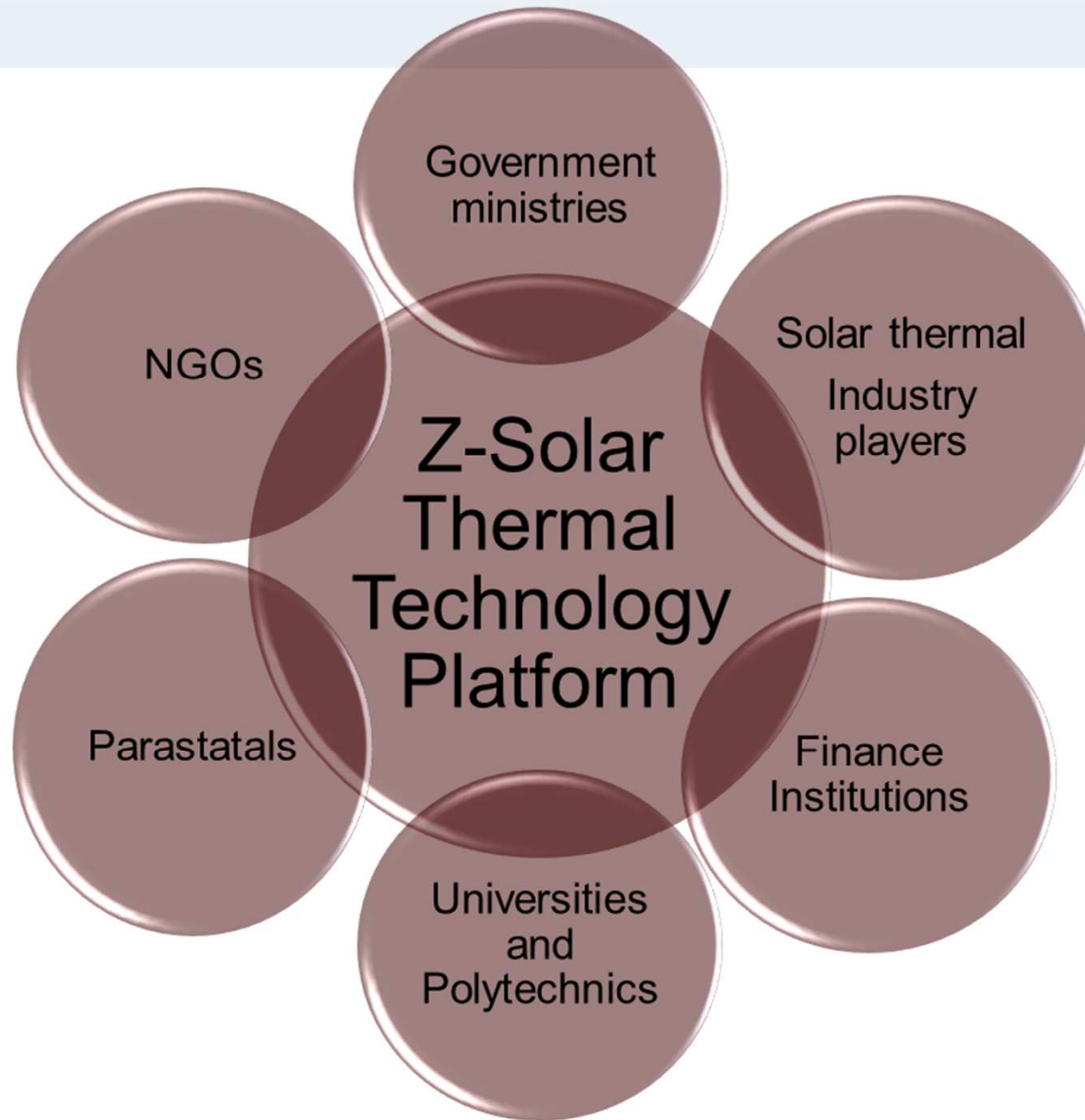


Methodology





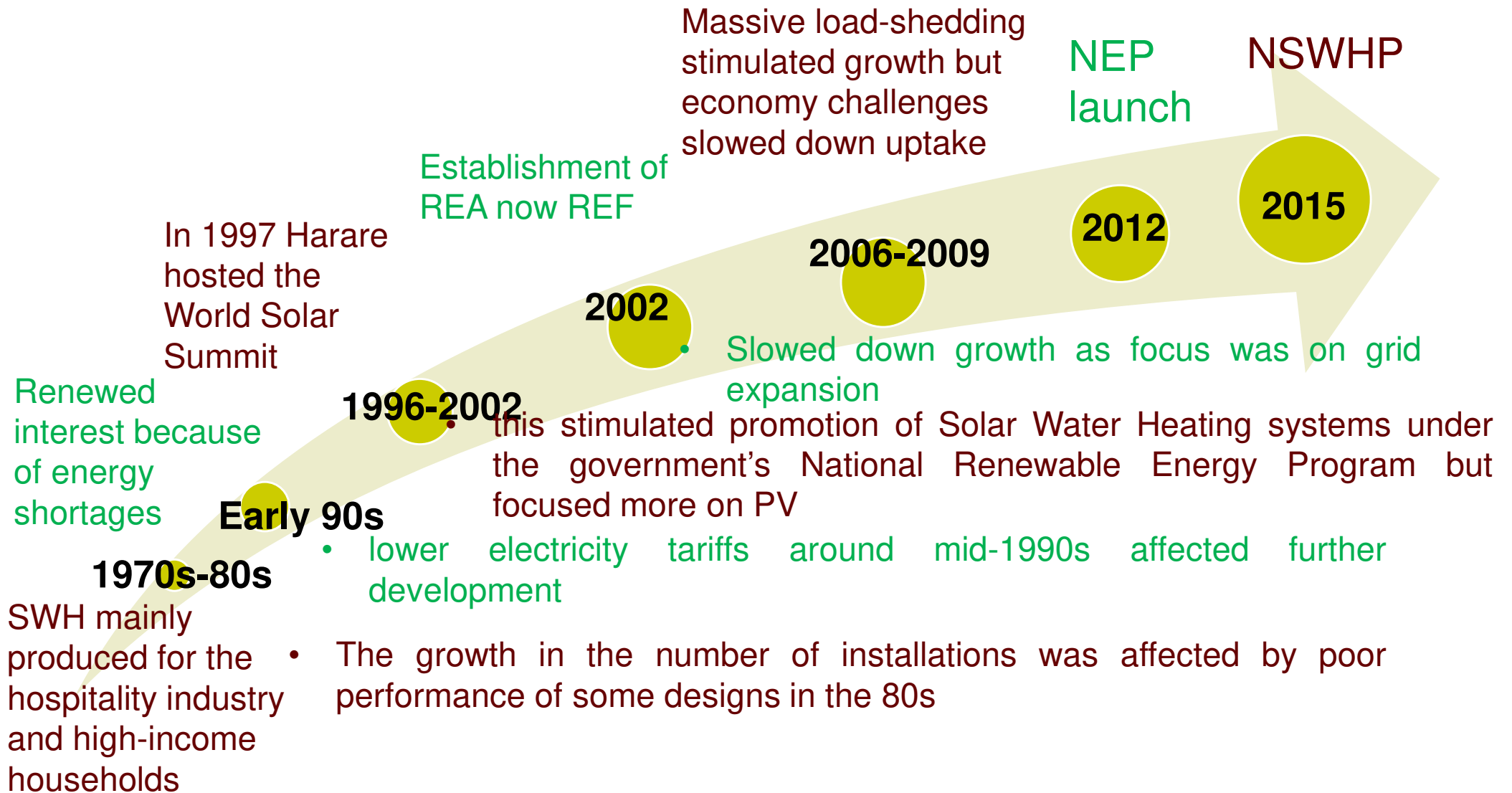
Establishment of Z-STTP – 2014-16



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History of Solar Energy in Zimbabwe



Z-STTP VISION and ROADMAP

Population size approx.
20 million inha.

2030

2 039 000 m²
Collector Area

Target = 0.1 m² per capita

LONG TERM

2025

SHORT TERM

2024

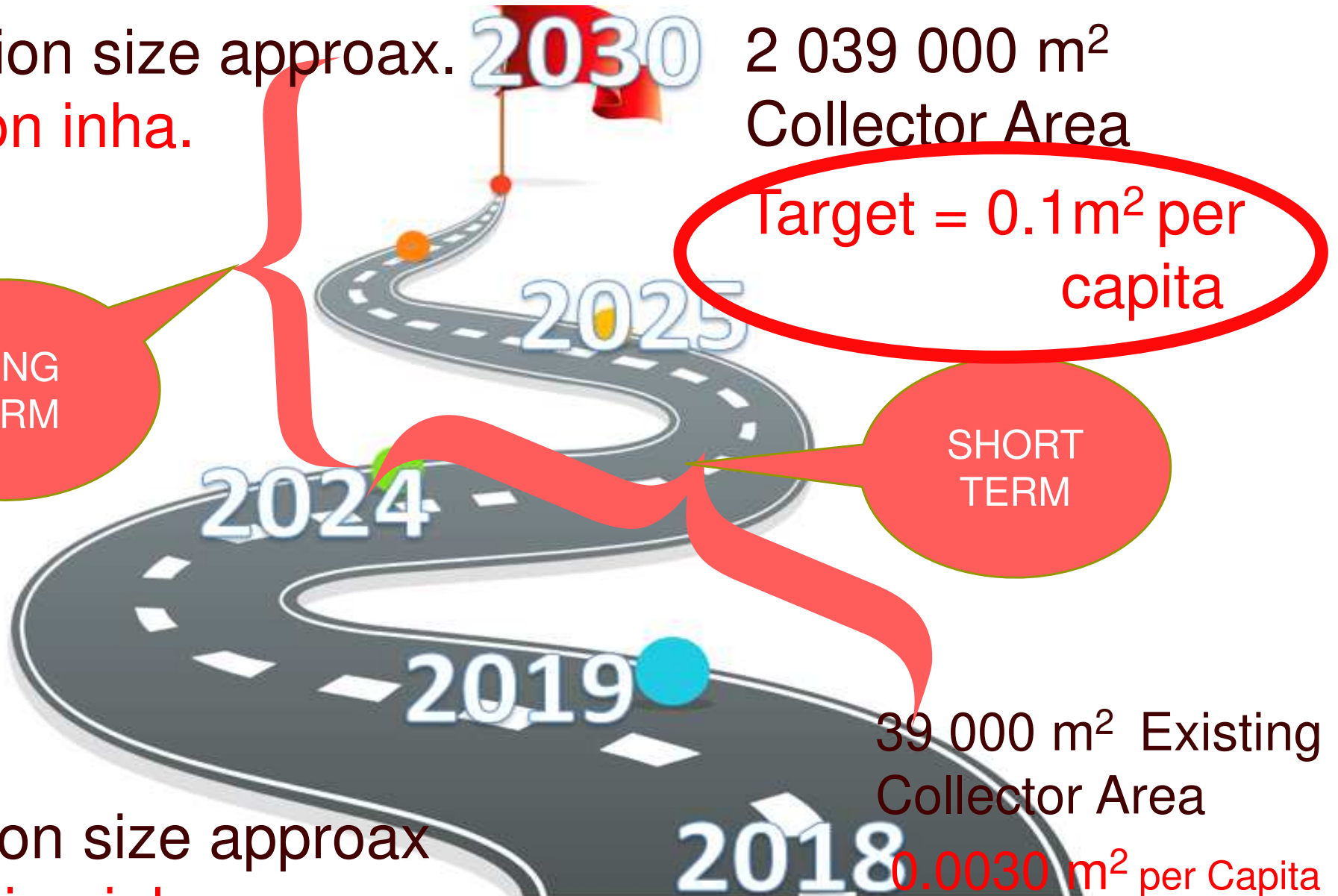
2019

39 000 m² Existing
Collector Area

Population size approx
13.6 million inha

2018

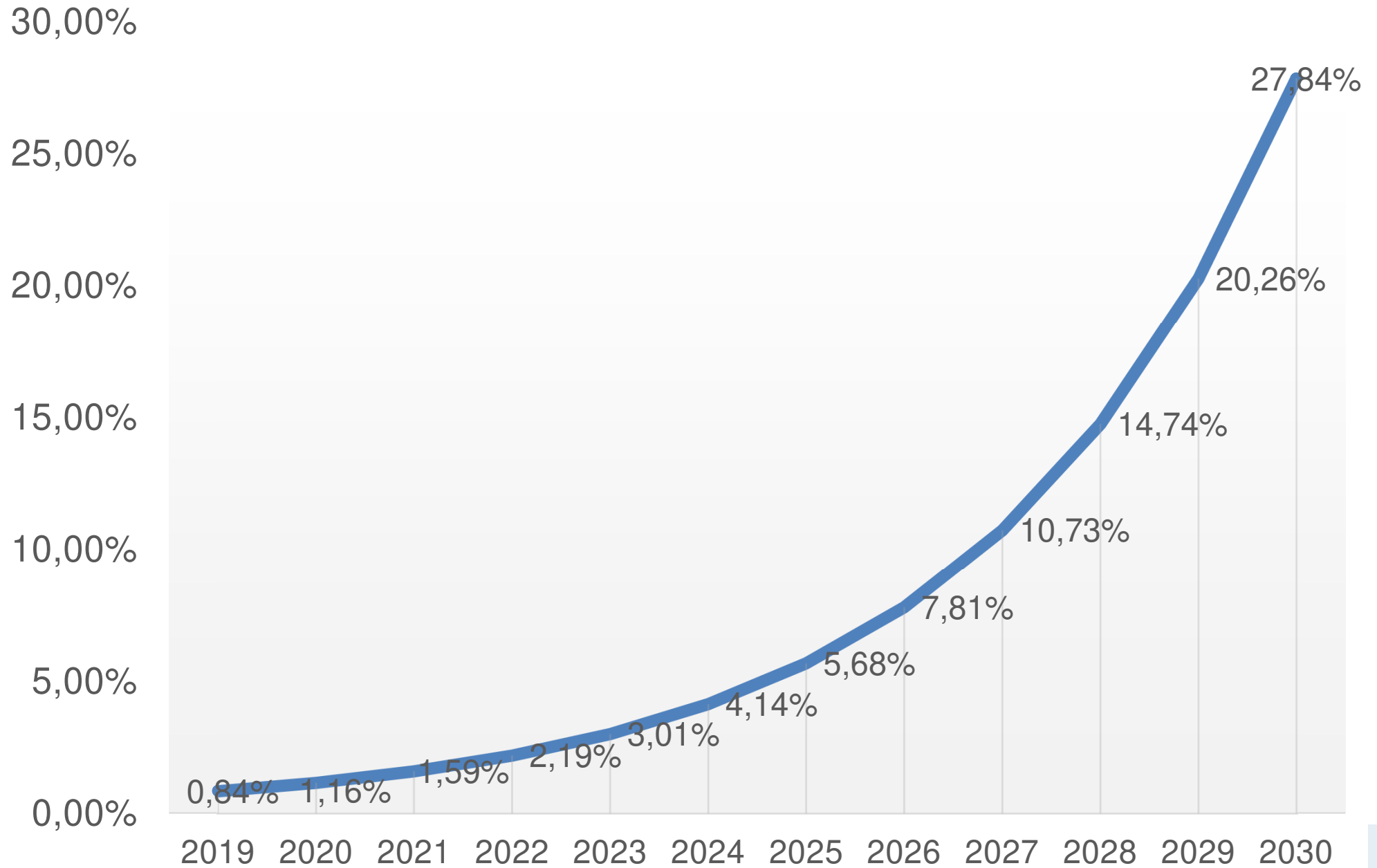
0.0030 m² per Capita



Sector	Specific Target Market	Number of Systems	Estimated solar collector area to satisfy demand	Percentage of Overall Vision
Domestic (Thermo-syphon and pressurised systems) 2-4 m ²	Existing electrified urban households (retrofitting)	300,000	600,000 m ²	30.00 %
	Non-electrified urban households and rural households	185,000	370,000 m ²	18.50 %
	New urban houses	425, 000	850,000 m ²	42.50 %
Public & Commercial (pressurised systems) 10-60 m ²	Hostels, Hospitals and Hotels	4,800	145, 000 m ²	7.25 %
Industrial (process heating and cooling) 50-200 m ²	Food & Beverages, Textile, Chemical, Mining , Agriculture etc.	350	35, 000 m ²	1.75 %
TOTAL			2,000,000 m ²	100.00 %



Annual implementation targets



Annual Implementation targets

AEE INTEC



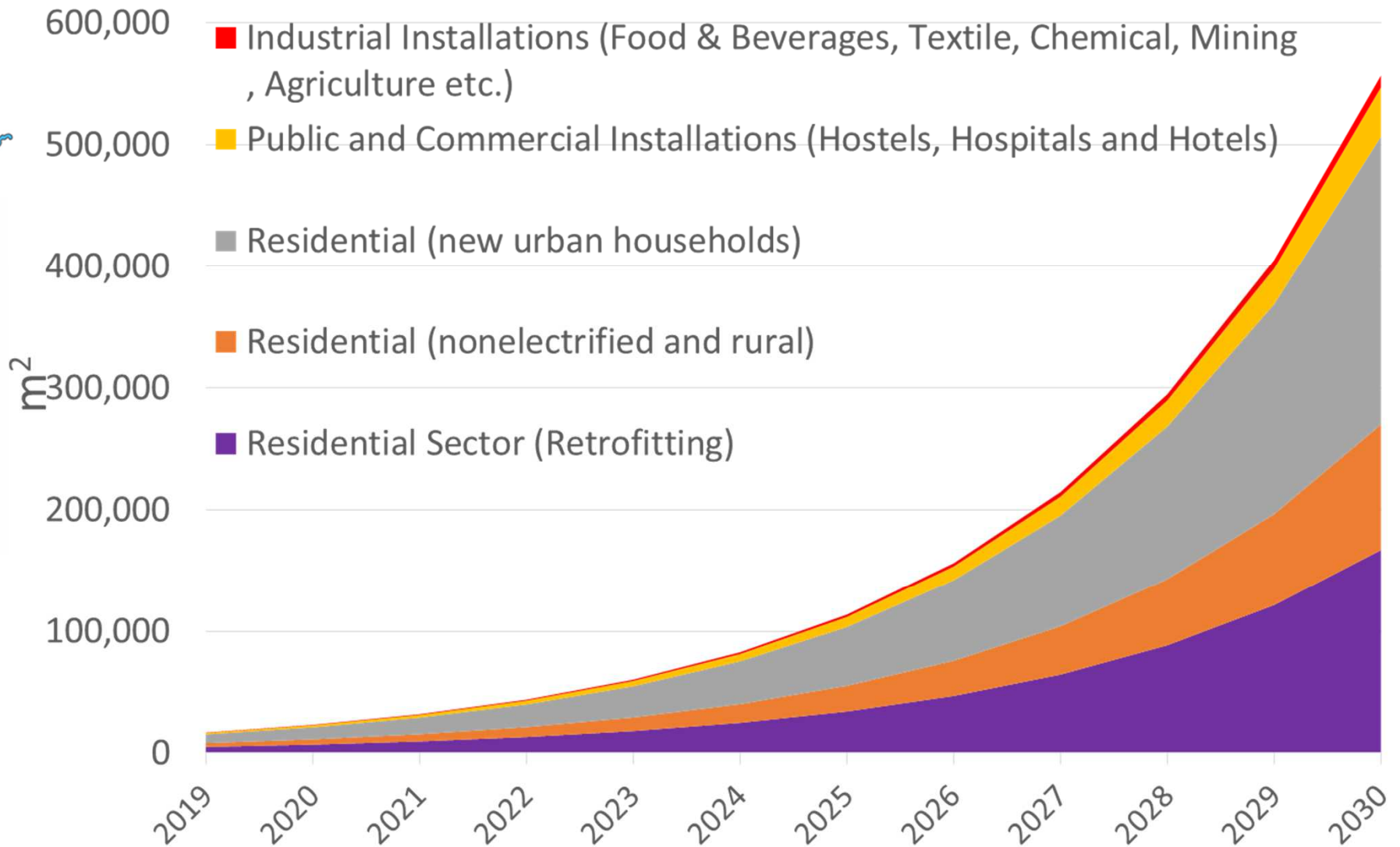
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	Resident-ial Sector (Retrofitting)	Resident-ial (non-electrified and rural)	Resident-ial (new urban households)	Public and Commercial Installations (Hostels, Hospitals and Hotels)	Industrial Installations (Food & Beverages, Textile, Chemical, Mining, Agriculture etc.)	Annual Installations	Cumulative
Year	[m ²]	[m ²]	[m ²]	[m ²]	[m ²]	[m ²]	[m ²]
Carry over from previous installations							39,000
2019	5,065	3,124	7,176	1,224	295	16,884	55,884
2020	6,960	4,292	9,860	1,682	406	23,201	79,085
2021	9,564	5,898	13,549	2,311	558	31,880	110,966
2022	13,142	8,104	18,618	3,176	767	43,807	154,772
2023	18,059	11,136	25,583	4,364	1,053	60,195	214,967
2024	24,814	15,302	35,153	5,997	1,447	82,714	297,682
2025	34,097	21,027	48,304	8,240	1,989	113,658	411,339
2026	46,853	28,893	66,375	11,323	2,733	156,177	567,516
2027	64,381	39,702	91,206	15,559	3,756	214,603	782,119
2028	88,466	54,554	125,327	21,379	5,161	294,886	1,077,005
2029	121,561	74,963	172,212	29,377	7,091	405,204	1,482,209
2030	167,037	103,006	236,636	40,367	9,744	556,791	2,039,000
Total	600,000	370,000	850,000	145,000	35,000	2,000,000	

Annual Implementation targets



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Implementation Plan



- Stakeholders support is key
- Same stakeholders for the Z-STTP need to support the roadmap
- Formation of a **National Taskforce** within the MoEPD to oversee implementation

Implementation Plan - Policy and GoZ programmes

- Develop **policy, standards and regulations**
 - supply (manufacture or import)
 - Installation (ensure competent and qualified personnel)
 - Maintenance
- Policy for **enforcing conformity** e.g Local gvt and ZETDC
- Support the development of **quality control testing centres** (SAZ)
- Research and Development funding (RCZ)

National
Energy
Policy
(NEP)

National
Renewable
Energy Policy
(NREP)

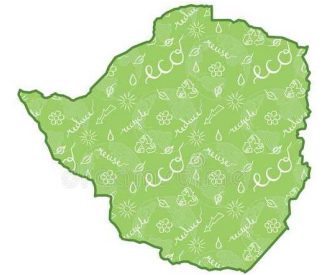
National Solar
Water Heating
Programme

National
Integrated
Energy
Resource Plan

National
Housing
Projects

Implementation Plan-Policy and GoZ programmes

- Enforce the **banning of electrical geysers**
- **Green Label Certification** for Hospitality operators to adopt SWH (**ZTA**)
- Consolidate **Government to Government** agreements and **PPPs** for institutional systems e.g. (UBH and HIT) and various flagship installations
- Drive **knowledge sharing and technology transfer** processes



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Implementation Plan- Policy and GoZ programmes

- Promote use of **SWH systems in rural areas (REF)**
- Promote **Industrial Installations (NSWH)**
Programme for Industry
- Promote initiatives for **dissemination of technical info. to line ministries** (Health, Education, Local Gov, Tourism, Agriculture, Industry)

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Implementation Plan-Financing

□ Grants

- **Non-profit making organisations** (public sector such as schools, hospitals and homes)
- **Government, NGOs and International Organisation**
- **Carbon credits** can be used as another source of funds for grant aided projects (REDD+ Projects)

□ Bank loans and Concessional loans

- Prospective financiers of the NSWHP have expressed **overwhelming interest in financing the project**
- However have raised concerns about how they will **recover their loans** from beneficiaries of the project.
- The financing model be made **sustainable after the duration of the NSWHP**



Implementation Plan-Financing

- Grace period in loans
 - Allow cost recovery to be made over an extended period using **electricity-bill savings**.
- Self-financing (motivated by government)
 - The government may **subsidise the procurement and installation costs of solar water heating systems**.
 - **Penalties for energy inefficiency** can assist in funding subsidies for a solar geyser roll-out programme.
- Budgetary allocation
 - The power utility can fund this as a **DSM investment through funding from Treasury**
 - programme can be **awarded a national project status** that can actually receive budgetary allocation.



Implementation Plan-Financing

- Loans Recovery
 - ZETDC has been tasked by the Ministry of Energy Power Development using the 3E ZETDC **prepayment vending platform to facilitate the recovery of loans** availed to the beneficiaries of the locally manufactured solar geysers from local financiers so as to lower the risk to the financiers.



Implementation Plan-Standards and Quality Assurance



- The Solar Energy Market in the **past** seen to be **largely unregulated**
 - resulting in the importation of and manufacture of **sub-standard products**.
 - These have led to reports of **high failure rate of imported technology and installations**
 - Gave the **solar technology bad reputation**
 - the market has **insufficient skilled and experienced system designers and installers**
 - Installers have **no formal focussed training in solar installation**.

Implementation Plan-Standards and Quality Assurance



- MoEPD, facilitating the following in order to control quality and promote continuous improvement:
 - **Training of installers** on how to install and maintain the systems
 - **Registration and certification** of plumbers or installers
 - Establishment of holistic regulatory framework that governs the solar water heating industry, inclusive of all downstream activities that support the industry
 - Training of local manufacturers in tendering procedures to stimulate competition

Implementation Plan-Standards and Quality Assurance



- ZERA,SAZ and SOLTRAIN have been involved in terms of training (manpower development) and standards development
 - Solar PV Training – ZERA
 - Registration and regulation of Suppliers - ZERA
 - Solar Thermal - SOLTRAIN
 - Standards and Quality Control – SAZ

Implementation Plan - Industry

- Develop capacity for producing units or some of the components locally
- Determine specific customer needs for the local market
- Produce high quality and affordable products that meet customer requirements
- Manpower development of personnel (design, manufacturing, installation and maintenance)
- Form professional bodies that represent their interests in terms of influencing policy

Implementation Plan - Industry

- Link with **educational institutions for R n D** in terms of new product developments, integration of solar thermal systems to existing systems, efficiency improvements
- Standardise, maintain and appraise **best work practices**
- **Flagship installations** especially for Industrial applications (Eg HIT and UBH)
- Develop **marketing** and information dissemination strategies to stimulate growth in the sector

Implementation Plan – Educational Institutions

- Drive RnD of different solar thermal technologies (SWH, CSP, Fruit n Vege Driers, Tobacco, Tea drying, Space Heating, Industrial Process Heating and Cooling etc.)
- Manpower Development
- Programs to raise awareness
- Carryout energy audits and encourage industry to keep statistics for thermal energy systems
- Monitor, analyse and Publish results from thermal installations (LCOE)
- Ministry of Primary and Secondary Education to catch them young

Policy Support and Roadmaps



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Since Development of Roadmap and Implementation Plan



- Launch of the Roadmap and Implementation Plan- Nov 2018
- Signing of the Zimbabwe Solar Thermal Technology Roadmap and Implementation July 2019
- February 2020, 3rd Policy Workshop for Zimbabwe with focus to convert Roadmap into Bankability Document
- March 2020, Setup of a taskforce comprising Ministry of Energy, Zimbabwe Energy Regulatory Authority, SOLTRAIN to initiate the process
- July 2020 found the taskforces developing ToR for hire of a consultant to develop Bankability Document and approach possible funders
- August 2020 Concept note and ToR was submitted to Ministry of Energy and Power Development

Since Development of Roadmap and Implementation Plan



Sept-Nov 2020 saw the engagement of a funder UNDP who had been working already with Ministry of Energy and Climate Change Dept in Ministry of Environment

December 2020 the tender for development of Bankability Document was raised

January 2021 – Award of tender and Inception meeting was held

February –April 2021 The Bankability Document was developed by the consultants and a draft was presented to the Ministry first before a validation workshop was help with stakeholders

Since then the document awaits Government Approval processes



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Other Milestones attained



- SI 2019-235 Electricity (Solar Water Heating) Regulations, 2019 (which outlawed installation of new electrical geysers in new buildings)
- Launch of the Renewable Energy Policy March 2019
- SOLTRAIN Conference in Harare 25th Nov 2021
- Policy Workshop in Harare 26 Nov 2021 (discussed Bankability Document and way forward)
- 3rd Renewable Energy Conference 23-25 March 2022



SOLTRAIN Conference in Harare 25th Nov 2021



- Designation of Trades by National Manpower Advisory Council (**NAMACO**)
- Development of National Certificate Curriculum for Artisans in Renewable Energy (led by Ministry of Higher and Tertiary Education, Science and Technology Development)
- Development of Degrees in Renewable Energy (Led by Universities)
- More demonstration systems
- 6 Sites with more than 36x200L Evacuated Tube Geyser
- 7x Training and Awareness Workshops have been undertaken since January 2021 with over 250 participants



Upcoming Events



11th April 2022 Housing Sector Workshop with Ministry of National Housing and Social Amenities, Ministry of Public Works and Ministry of Energy

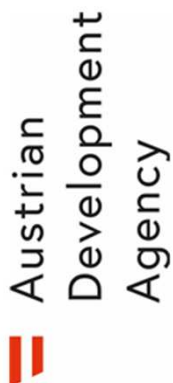


26-30 April 2022 SOLTRAIN Exhibition at the Zimbabwe International Trade Fair in Bulawayo, Zimbabwe

June 2022, Artisans Training in Harare

Technical Tours of Demonstration Sites

Possible Roll-out programmes





Acknowledgements



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Thank you

