



SWHS -2032

POTENTIAL, CHALLENGES AND ACTIONS REQUIRED

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WHY SWHS ?

Indian Energy Scenario & Potential for SWHS

- Primary energy demand expected to increase three-fold from the 601 Mtoe (million tonnes of oil equivalent) of 2012 to 1859Mtoe in 2032.
- Presently 77% of oil & 31% of primary energy are imported. By 2032, 93% of oil and almost 70% of primary energy (Coal) will need to be imported.
- A large part of India's energy comes from fossil fuels, particularly coal, the CO₂ emissions likely to rise by more than three-fold.

Final Energy Consumption 2012: 421 Mtoe

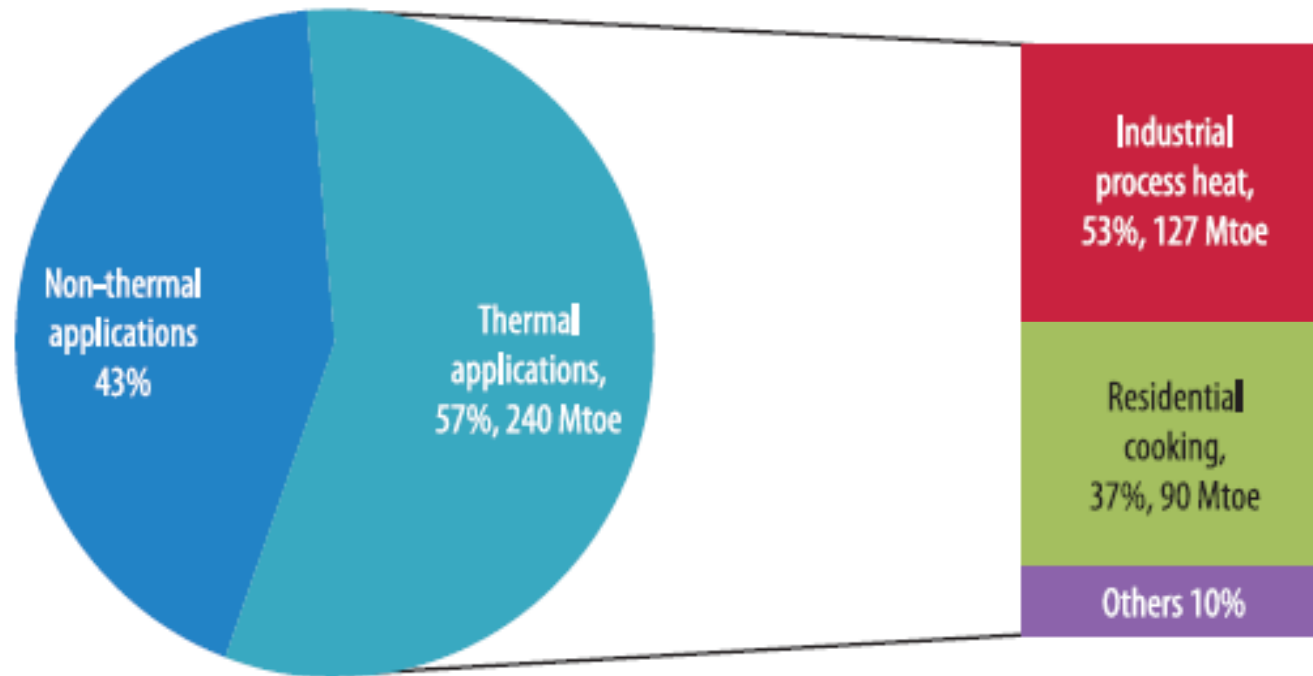


Figure 1.1 Share of thermal energy in final energy consumption⁴



Solar energy Conversion

- SWHS has very high efficiency (upto70%)* as compared to crystalline solar PV modules (10%- 15%)
- SWHS being off-grid in nature minimal transmission losses.
- Offers excellent opportunities for local manufacturing and employment.

Market Potential

Sr. No.	Description	2014	2032
1.	Residential buildings- Total	13.4 GW _{th}	138.5 GW _{th}
2.	Rural Share	12%	51%
3.	Energy Delivered by SWHS in residential buildings	8.6 TWh _{th}	76.8 TWh _{th}

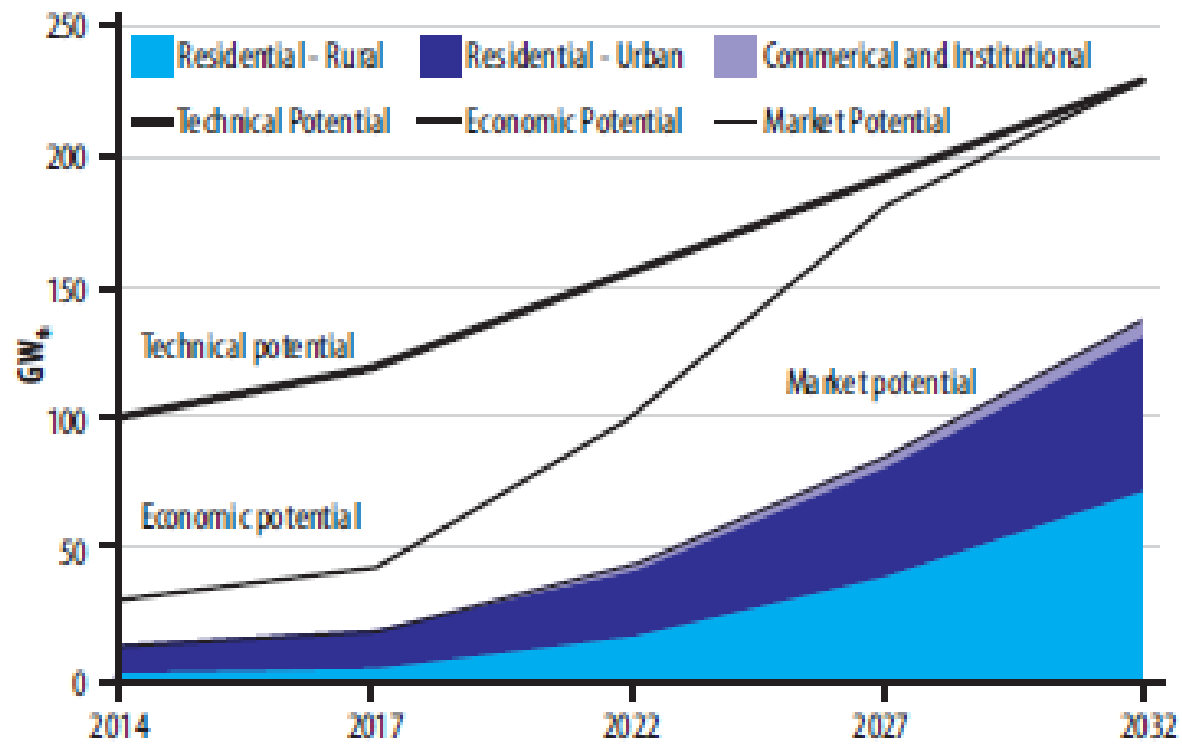
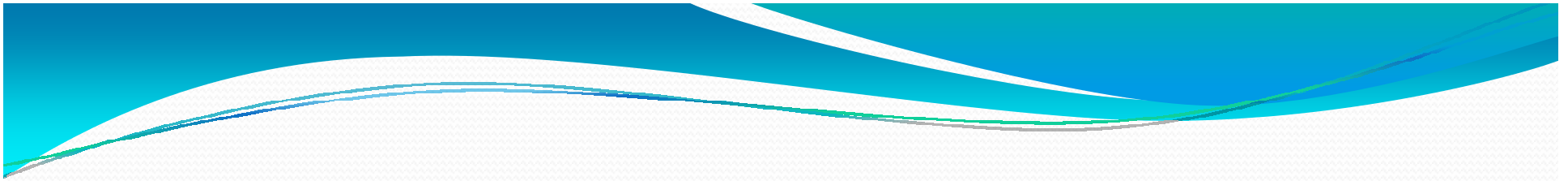


Figure 4.12 Market potential of SWHs in buildings (GW_{th})

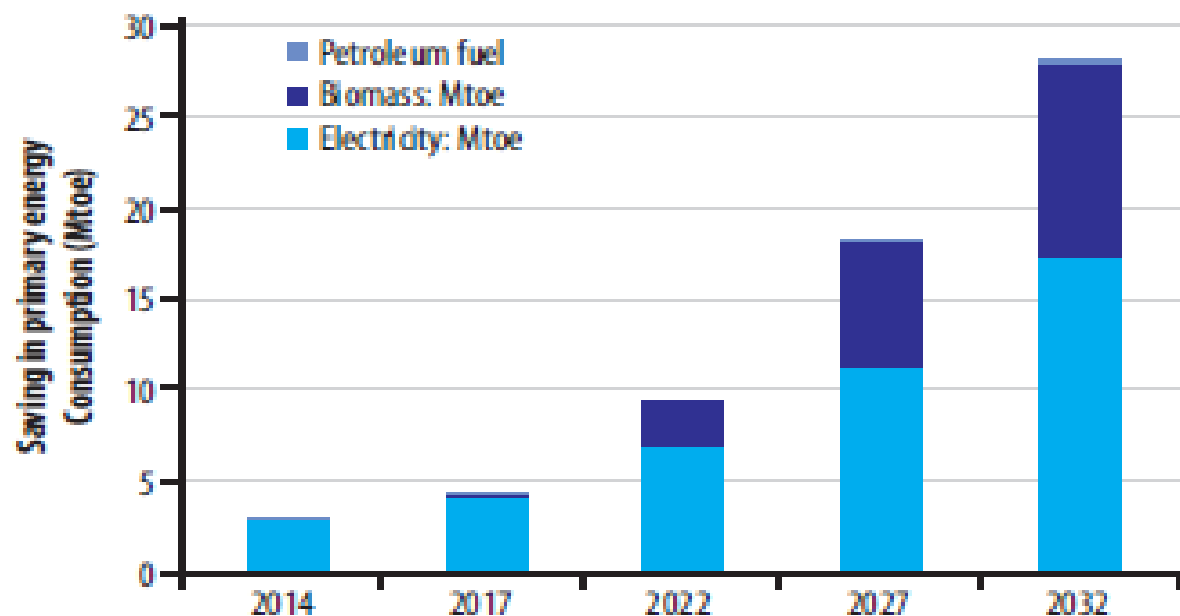


Figure 4.18 Savings in primary energy consumption from realisation of market potential

Box 4.1 Key findings of potential assessment of SWHs in buildings

- The market potential for SWHs in buildings is expected to grow 10 times between 2014 and 2032 and is expected to reach 138.5 GW_{m} by 2032.
- Most of the future market potential will come from smaller towns and rural areas. In 2014, rural areas accounted for ~12% of the market potential; they are expected to account for ~51% of the market potential by 2032.
- The annual electricity savings from fully exploiting the market potential (2032) for SWHs in buildings will be equivalent to annual electricity generation from ~64 GW_{p} of solar PV installations.

Process Heat Applications in the Industrial Sector

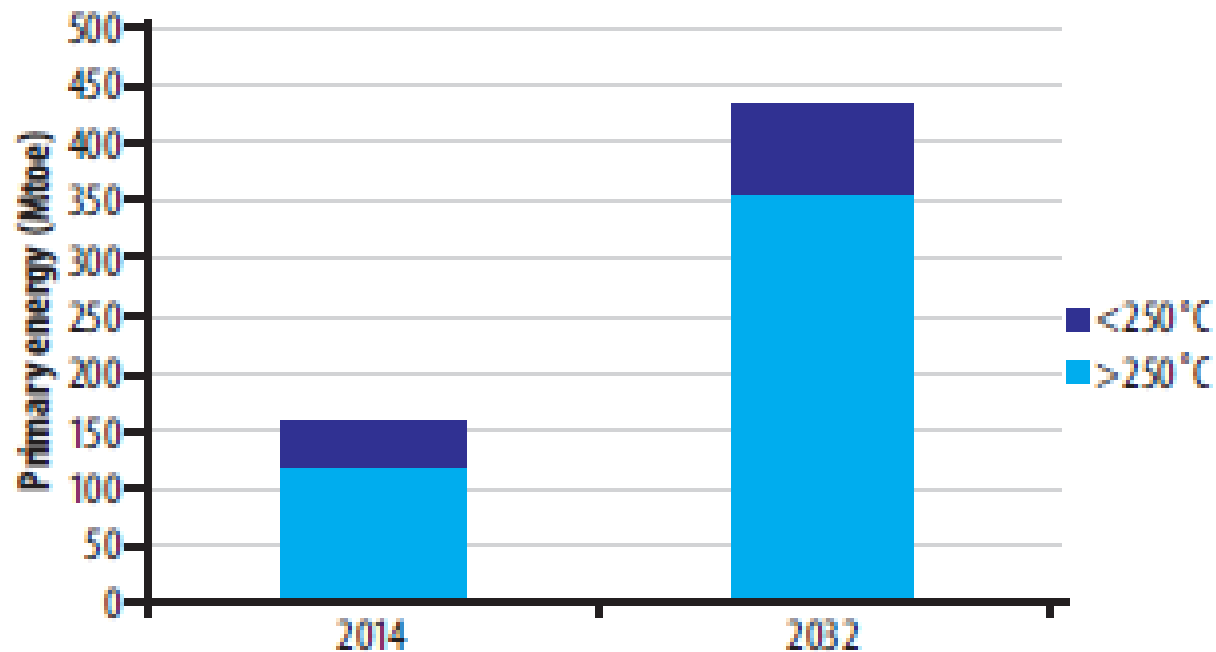


Figure 4.21 Primary thermal energy demand for industrial sector

- Solar fraction can be upto 50% in smaller industries having steam requirement less than 50tonns per day and less than 10% in case of larger industries, average solar fraction potential being 21% for thermal energy demand below 250°C

Market Projection:

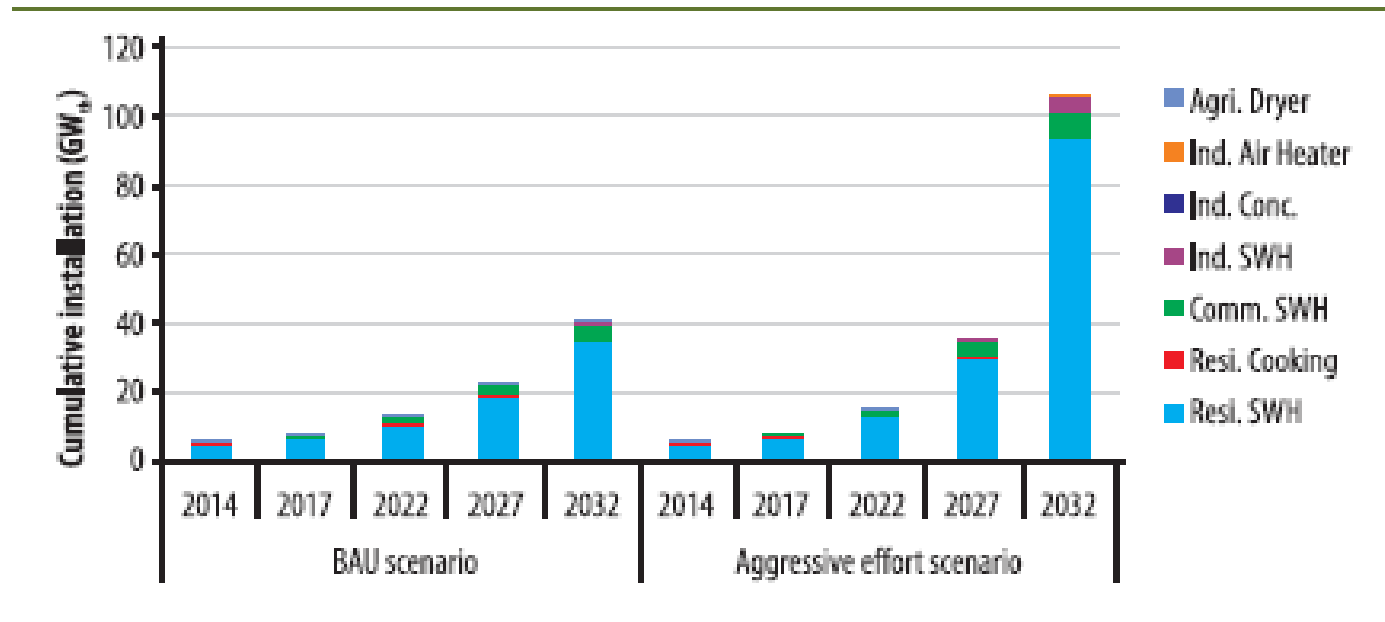


Figure 4.23 Cumulative solar technologies installation under BAU and aggressive effort scenario

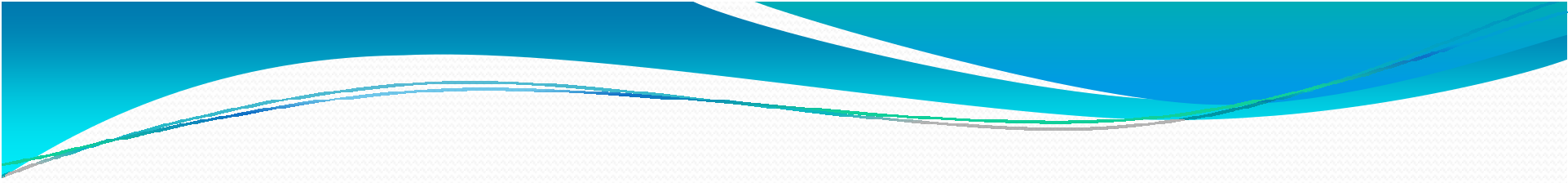


- Business-as-Usual Scenario - Under this scenario, it is assumed that the past and present market trend would continue in the future. However, the views of key stakeholders on the future market and key decisions (e.g., removal of capital subsidy for SWHs) have been taken into account under this scenario.
- Aggressive Effort Scenario - Under this scenario, it is assumed that there would be aggressive effort to improve solar thermal technology deployment. Improved economic viability over time (due to increase in fuel prices and corresponding increase in overall saving), more policy regulation and enforcement, improvements in supply chain for solar thermal technologies, and availability of financial mechanisms have been considered to accelerate the market deployment of solar thermal technologies.



Goal 2032:

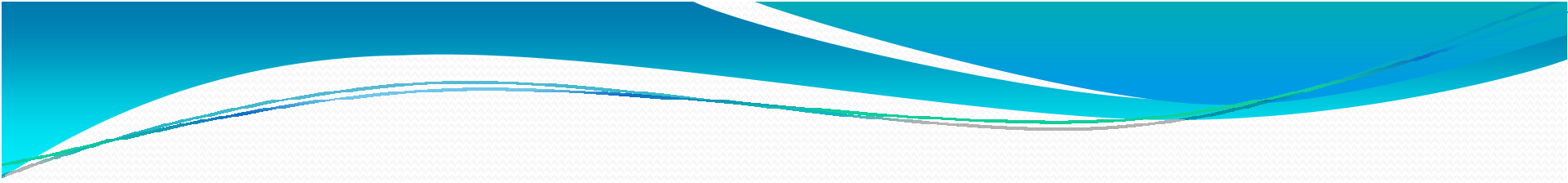
- 100-120 GWth, delivering 65-80 TWh energy annually.
- 90% of this from through SWHS using low temperature collector technologies.
- Annual saving of 68000 GWh of electricity at consumer level/85000 GWh at generation point.
- This is equivalent to 14000 MW thermal power plant or 64 GWp solar PV capacity.

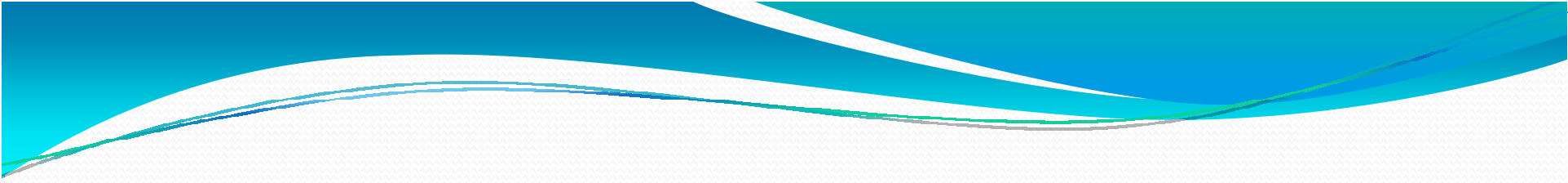
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- Local manufacturing component in solar PV – approx 15-25%
 - Local manufacturing component in solar thermal – approx 70-80%.
 - Hence, Solar Thermal more apt for “Make in India”!



Strategies/actions required:

- Accelerated deployment of SWHS in residential sector – 100% mandation for new buildings of all types and step by step mandatory installtion on existing urban buildings.
- Quality labelling of SWHS.
- Innovative incentives for SWHS buyers by way of
 1. Income Tax deduction to individual/salaried buyers.
 2. Rebate in electricity bill and property tax.
 3. Provision for penal electricity tariff for existing buildings till implementation of SWHS of designated capacity
- Special focus on zones 2,3 and 4 as per Greentech report.

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- Research and Development scheme for developing pertinent solutions to overcome the challenges like multistoreyed buildings and zone 3 and 4.
 - Include SWHS/ST mandate for industry and incentive in other ministry schemes.
 - Differential rate structure for commercial/industrial users of coal/FO/HSD/LPG for users of SWHS as per mandate and those not complying.
 - Design special cluster policy for Solar Thermal manufacturing.

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- Provide incentives for accredited manufacturers.
 - Clear pending subsidies to DCP's.
 - Mandatory BIS marking for all manufacturers.
 - Accelerated depreciation of 100% in the first year itself for industries.
 - Anti-dumping duty on imported systems.
 - Make in India- capacity building and skill development.



Questions?



Thank You!