Financing of Solar Water Heaters in Namibia*

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Barrier Removal to Namibian Renewable Energy Programme (NAMREP)

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ANGOLA
ZAMBIA
Katima Mulilo
Ondangwa
Rundu
Grootfontein
Namib Desert
Swakopmund
Walvis Bay
Gobabis
WINDHOEK
BOTSWANA
Kalahari Desert
South Atlantic Ocean
Rehoboth
Keetmanshoop
Lüderitz
Karasburg
SOUTH AFRICA
0 100 200 km
0 100 200 mi

Solar Energy and Namibia

- On average Africa has 50% more sunshine per unit area than Europe or the U.S.
- On average Namibia has 20% more sunshine per unit area than Africa or 80% more than Europe or the U.S.
- Vast nation - Highly sparse population
- Net importer of Energy from South Africa
- Namibia has ideal conditions for Solar Energy applications

What is Stopping the Increased Use of Solar Energy?

Some bottlenecks (or “barriers”) exist, which inhibit the growth of RE market in Namibia. These can be summarized under five categories

Barriers to Growth of RE Market

- Capacity
- Institutional
- Public Awareness & Social Acceptability
- Financial
- Technical

NAMREP Project Objective

To increase affordable access to sustainable energy services, accelerate market development for renewable energy technologies and thus also protect the environment by reducing market barriers to the demand for clean energy services in Namibia.

Project Features

- 5 year Project
- UNDP is the GEF Implementing Agency
- MME is Executing Agency.
- Started in Feb 2004

Life-cycle costing tool

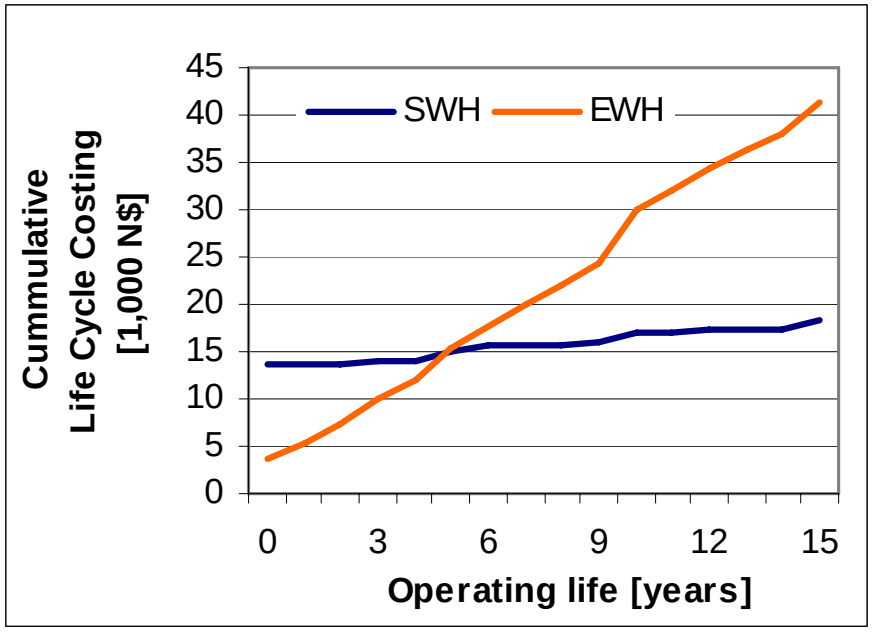
- The tool:
  - Calculates the all-inclusive cost of SWH's and EWH's over a 15 year period
  - Plots the results on a graph
  - Calculates the years to breakeven
  - Calculates the savings

Domestic Case

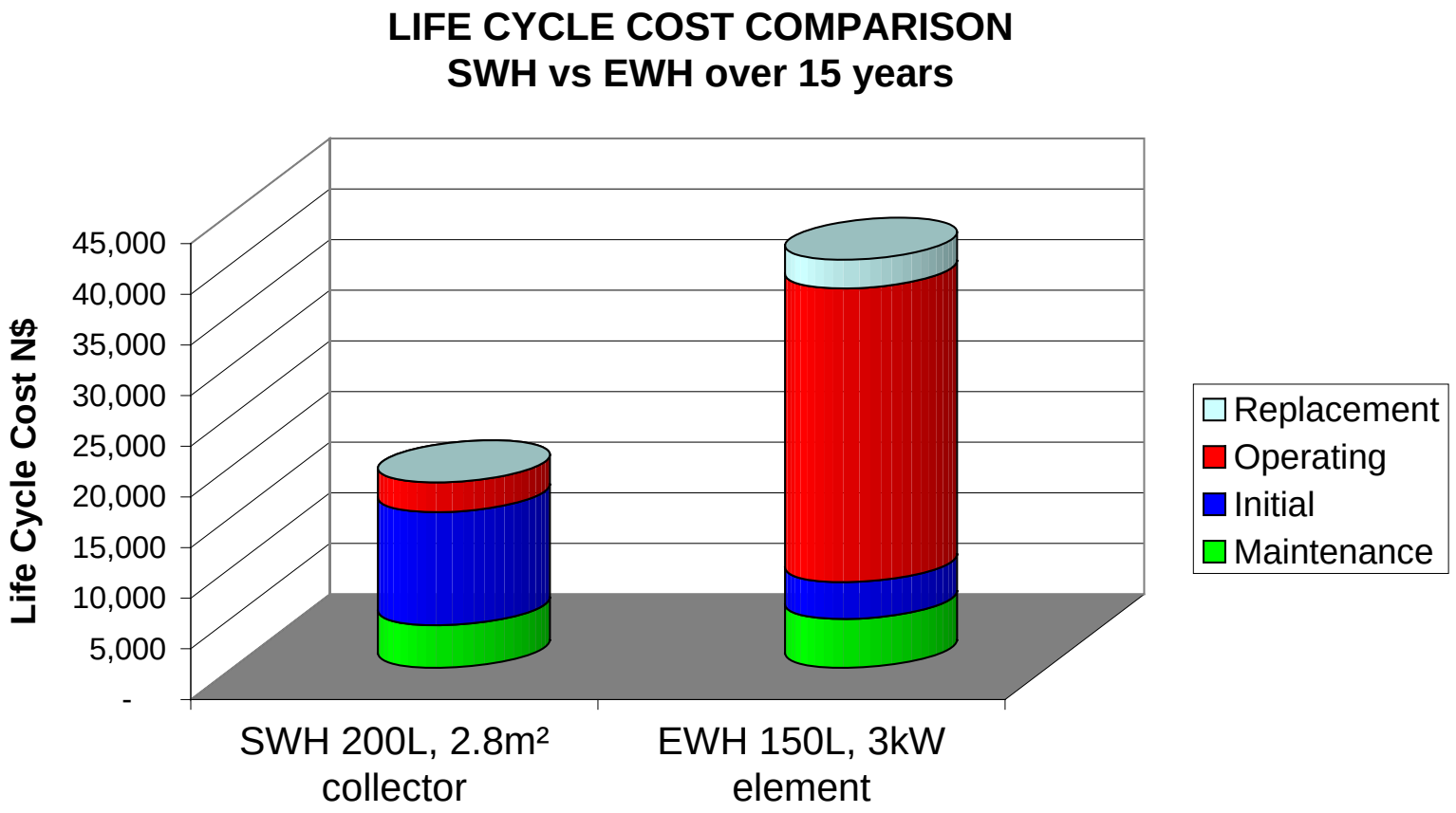
- Life cycle costing (LCC) ***used as a tool*** to evaluate SWH vs. EWH
- Based on “standard” 5 person household consuming 30 litres hot water per person per day
- 200L SWH with element connected instead of 150L EWH
- Constant dollar approach – excludes inflation

Domestic Case

- LCC comparison between EWH and SWH for Windhoek, pre-payment tariff, breakeven 4.9 years

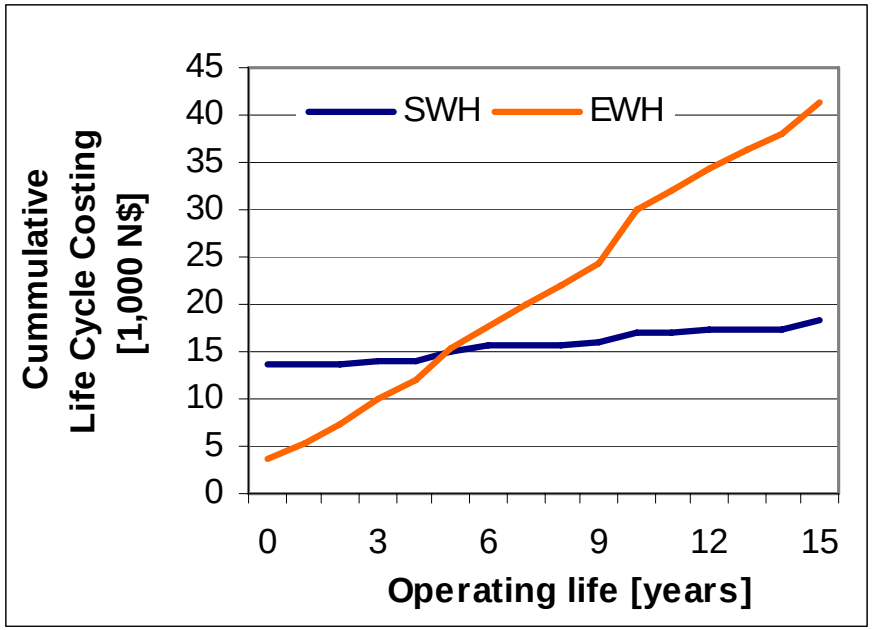


Domestic Case



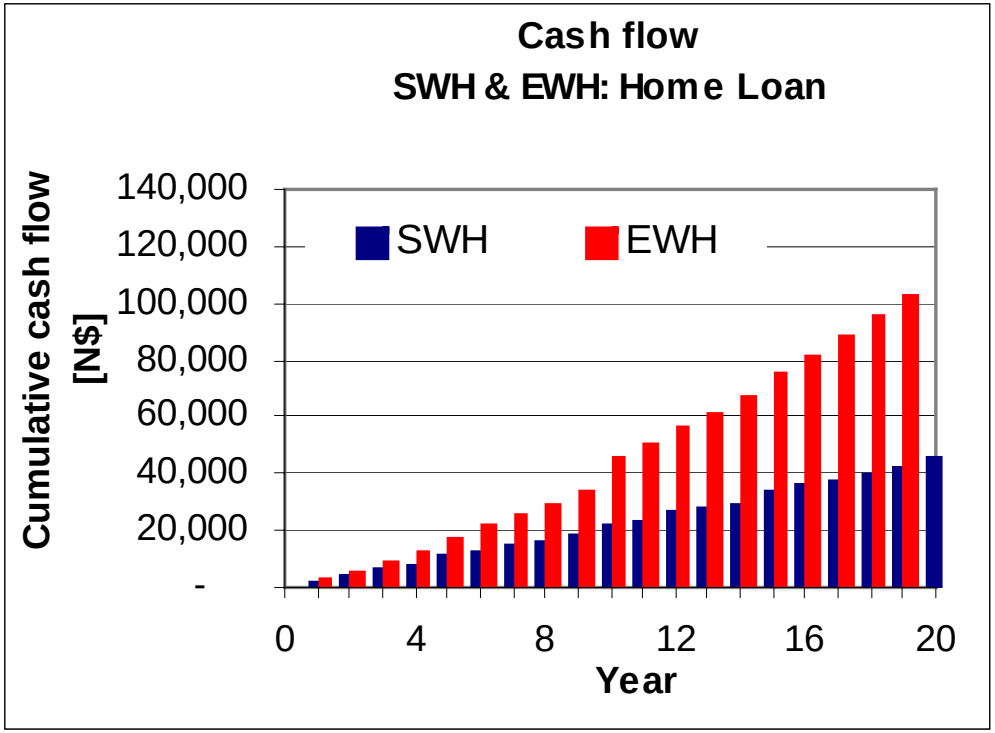
Domestic Case

- Breakeven is all very well, but what about financing paradigm? Few people buy EWH with cash.



Domestic Case

- Financing SWH or EWH through a home loan (11.5%, 20 years)



Domestic Case

- Monthly expenses for N$100,000 house with EWH or SWH in the first year.

	EWH		SWH	
Loan capital	N$	100,000.00	N$	110,000.00
Monthly home loan payment	N$	1,066.43	N$	1,173.07
Monthly electricity consumed by EWH	N$	163.00		
Total monthly expense	**N$**	**1,229.43**	**N$**	**1,173.07**

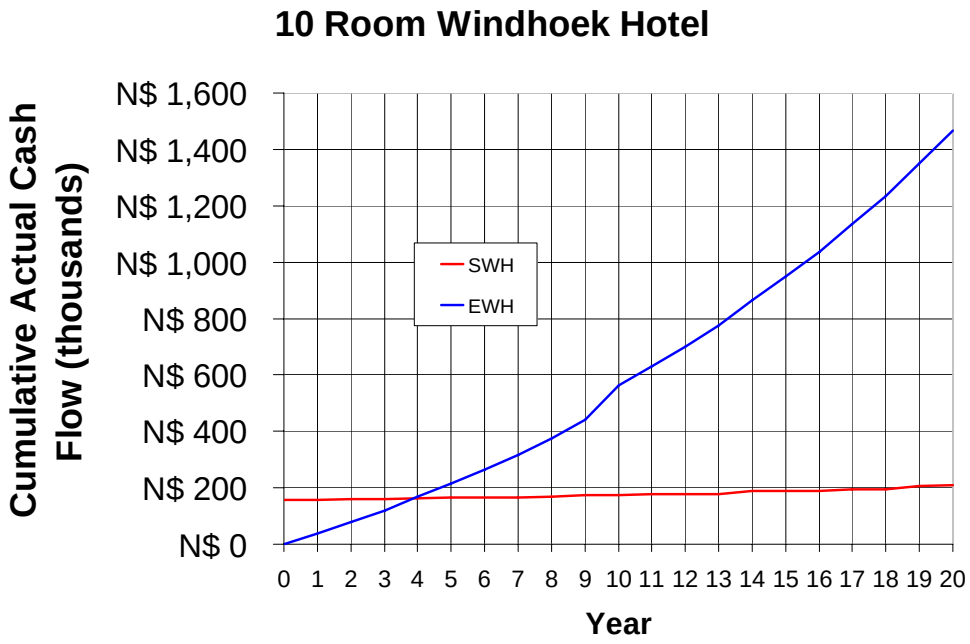
- SWH is N$56 cheaper than EWH per month in the first year.

- Both EWH and SWH financed through home loan

  11.5%, 20 years, Windhoek pre-payment, 5 persons using 150L per day

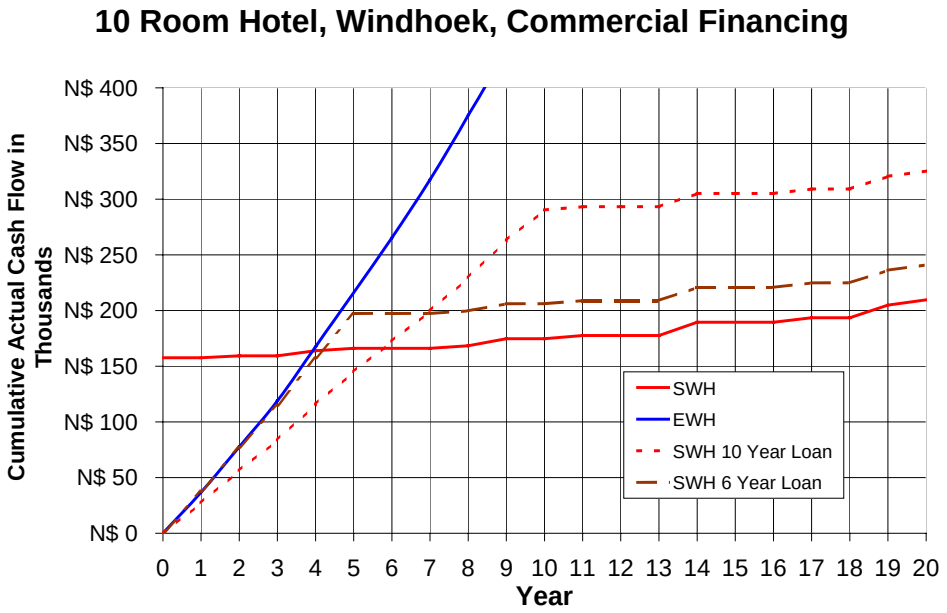
Commercial Case

- Small Windhoek Hotel, EWH 45kW load
- N$160,000 capital expense, including plumbing retrofit
- 3.9 year breakeven (MD Tariff)



Commercial Case

- Same small Windhoek Hotel
- Commercial finance, 11.5%
- Immediate operational savings!



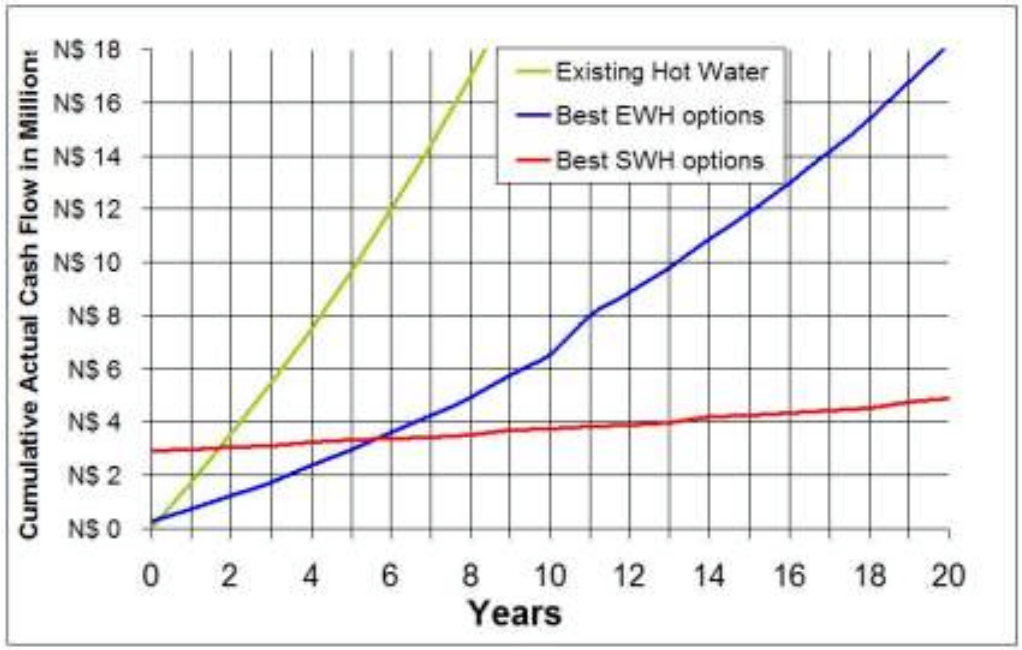
Institutional Case - UNAM

- UNAM Windhoek Campus
- HFO (diesel) boiler and EWH
- Present annual cost of hot water generation (MD tariff)

	Estimated Hot Water Consumption (kL / annum)	*Present Annual Cost (N$)*	*Cost / Litre (N$/L)*
Boiler System	4,751	N$ 1,338,462	N$ 0.28
Electrical Systems	9,931	N$ 377,180	N$ 0.04
Totals	**14,682**	**N$ 1,715,643**	**N$ 0.12**

Institutional Case - UNAM

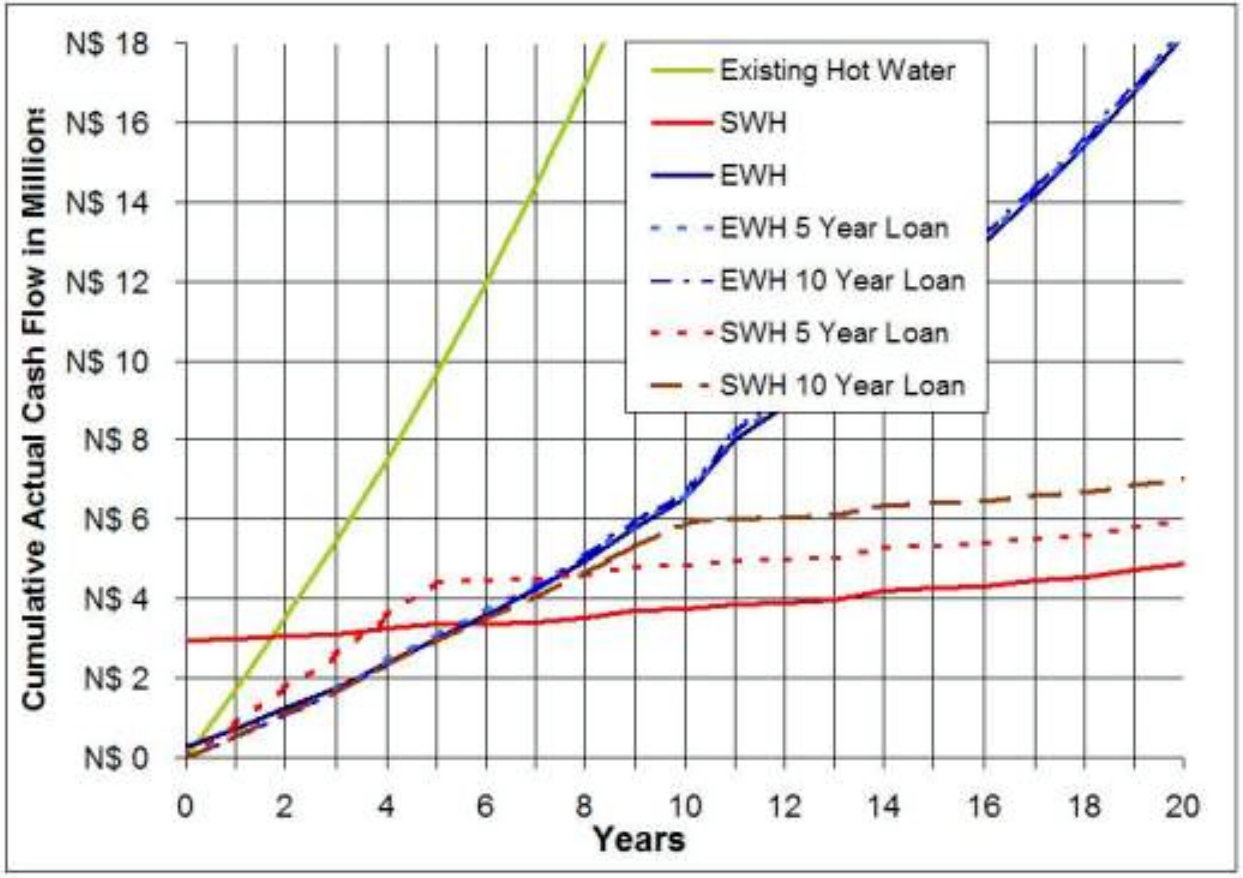
- LCC SWH & EWH Options



Unam Campus	CapEx	LCC	LCC Savings
Existing Hot Water	N$ 0.00	N$ 65,494,000.00	N$ 0.00
Electrical Water Heating	N$ 264,000.00	N$ 18,175,000.00	N$ 47,319,000.00
Solar Water Heating	N$ 2,943,000.00	N$ 4,875,000.00	N$ 60,619,000.00

Institutional Case - UNAM

- Financing vs. capital expenditure



Conclusion

Thus, apart from environmental benefits:

- SWH use has economic benefits for the home owner.
- SWH use has economic benefits for commercial and institutional entities.

SWH/EWH Maintenance

EWH Maintenance

- 3-5 Years
  - Replace thermostat
  - Replace pressure valve
  - Replace Anode
- 10 Years*
  - Replace system

* Without maintenance and depending on water quality, replacement can be after 5-10+ years.

SWH Maintenance

- 3-5 Years
  - Replace thermostat
  - Replace pressure valve
  - Replace Anode
- 20 Years*
  - Replace system

*Or longer, subject to system quality.

LCC tool: MAIN page