



ECONOLER

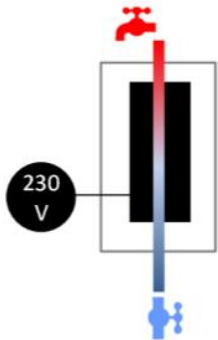
In Collaboration with:



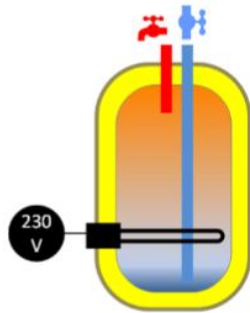
MEPS FOR ELECTRIC STORAGE WATER HEATERS

Paul Waide, Dakar, 22 May 2019

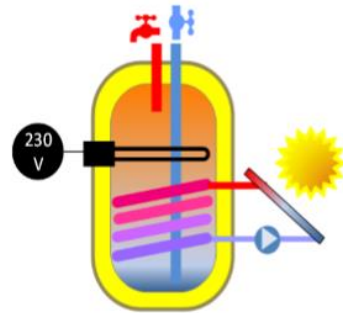
IN PRINCIPLE THERE ARE MANY TYPES OF ELECTRIC WATER HEATER



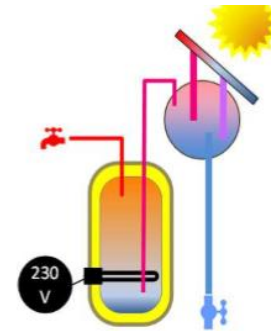
EIWH



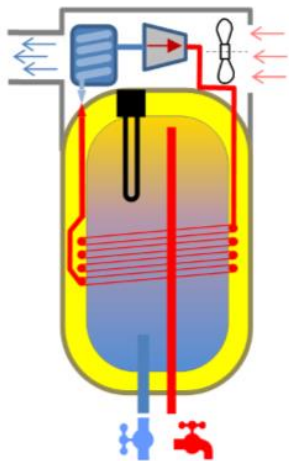
ESWH



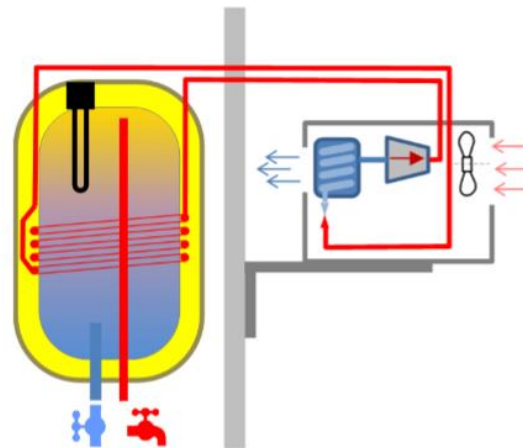
Solar-ESWH
(North/Central EU)



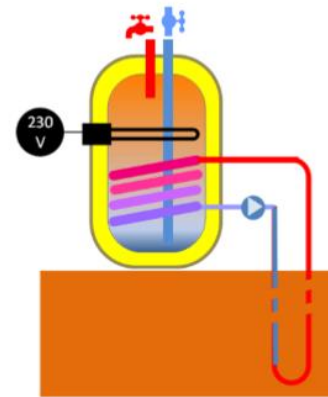
Solar-ESWH
(South EU)



HPWH mono

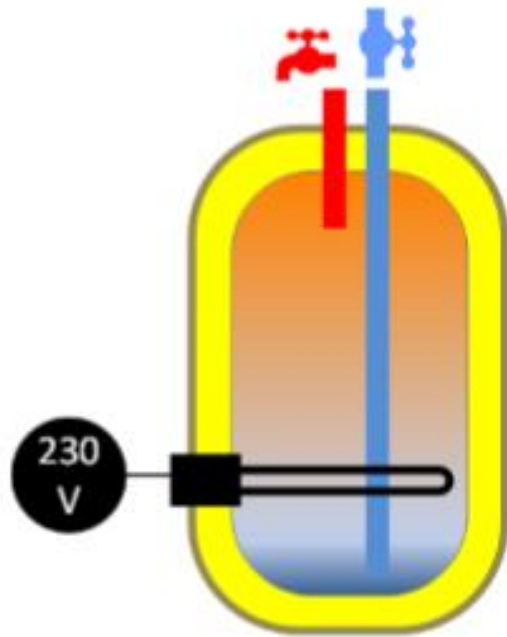


HPWH split (type 'EcoCute')



GSHPWH

THE MARKET APPEARS TO BE DOMINATED BY ELECTRIC STORAGE WATER HEATER TYPES



ESWH

Instantaneous types may also be common but have no savings potential from MEPS

MARKETS

- A provisional analysis shows that no one country dominates water heater imports into ECOWAS
- China has the largest share (of a single country) but this is between 20 and 30%
- Other important source of imports are thought likely to be Turkey, EU, Egypt
- We have no evidence of water heater manufacturing within ECOWAS

WATER HEATERS: OVERVIEW

Based on available data and regional comparison:

- Sales are thought to be ~ 300k units per year
- Typical lifetimes will be 12-18 years
- Average capacity is unknown but is likely to be between 60 and 150 litres
- Average energy performance is unknown
- Estimated total annual electricity consumption of 900 GWh or more from 10 million fans.

Note: These are estimated based on available data from other countries in the region, not from actual survey.

ENERGY PERFORMANCE TEST STANDARDS

- most test standards are specific to the water heater technology, which are for electrical equipment: storage water-heaters, heat pump water heaters and electrical instantaneous water heaters
- ISO and IEC together cover only electrical storage water-heaters and heat pump water heaters.
- European and Chinese test standards cover almost all water heater technologies but are differentiated by technology type

ENERGY PERFORMANCE TEST STANDARDS

Reference	Name	Content
IEC 60379:1987	Methods for measuring the performance of electric storage water-heaters for household purpose	States and defines the principal performance characteristics of electric storage water-heaters, which are of interest to the user and to describe the standard methods for measuring these characteristics. This standard is concerned neither with safety nor with performance requirements.
EN 50440:2015	Efficiency of domestic electrical storage water heaters and testing methods	<p>Storage water heaters, Water heaters, Storage heaters, Electric heaters, Heaters, Heating equipment, Electrical household appliances, Household equipment, Performance testing, Mounting position, Temperature measurement, Thermostats, Energy consumption, Accuracy, Verification, Volume</p> <p>This standards replace EN 60379:2004, which was an EN standard based on 60379:1987 (modified)</p>
GB/T 20289 – 2006	Electrical storage water heaters	This standard specifies the use of household and similar storage-type electric water heaters products, structural requirements, performance requirements, test methods, manufacturing and production testing, inspection rules, signs, packaging, transport and storage.

ENERGY SAVINGS POTENTIALS

- With electric storage water heaters the electrical resistance heater operates at a 100% efficiency
- The only way to go beyond this is to use a heat pump (which exploits ambient heat) but this will dramatically increase the cost of the product and is not likely to be affordable for the mass market in the ECOWAS region
- The other options are to reduce the standing losses by improving the insulation
- Some savings can also be achieved by optimising reheating against the draw-off pattern

ENERGY SAVINGS POTENTIALS

- For a very poorly or uninsulated product the standing losses could account for >20% of the total energy use – good insulation could reduce these losses by up to 80-90%
- All water heater MEPS around the world have begun by targeting lower standing losses as this is simple to do and simple to verify
- Well established programmes in advanced economies with major purchasing power (EU/USA) have also targeted draw-off control/heating optimisation but the additional savings are very small and the complexity is considerable

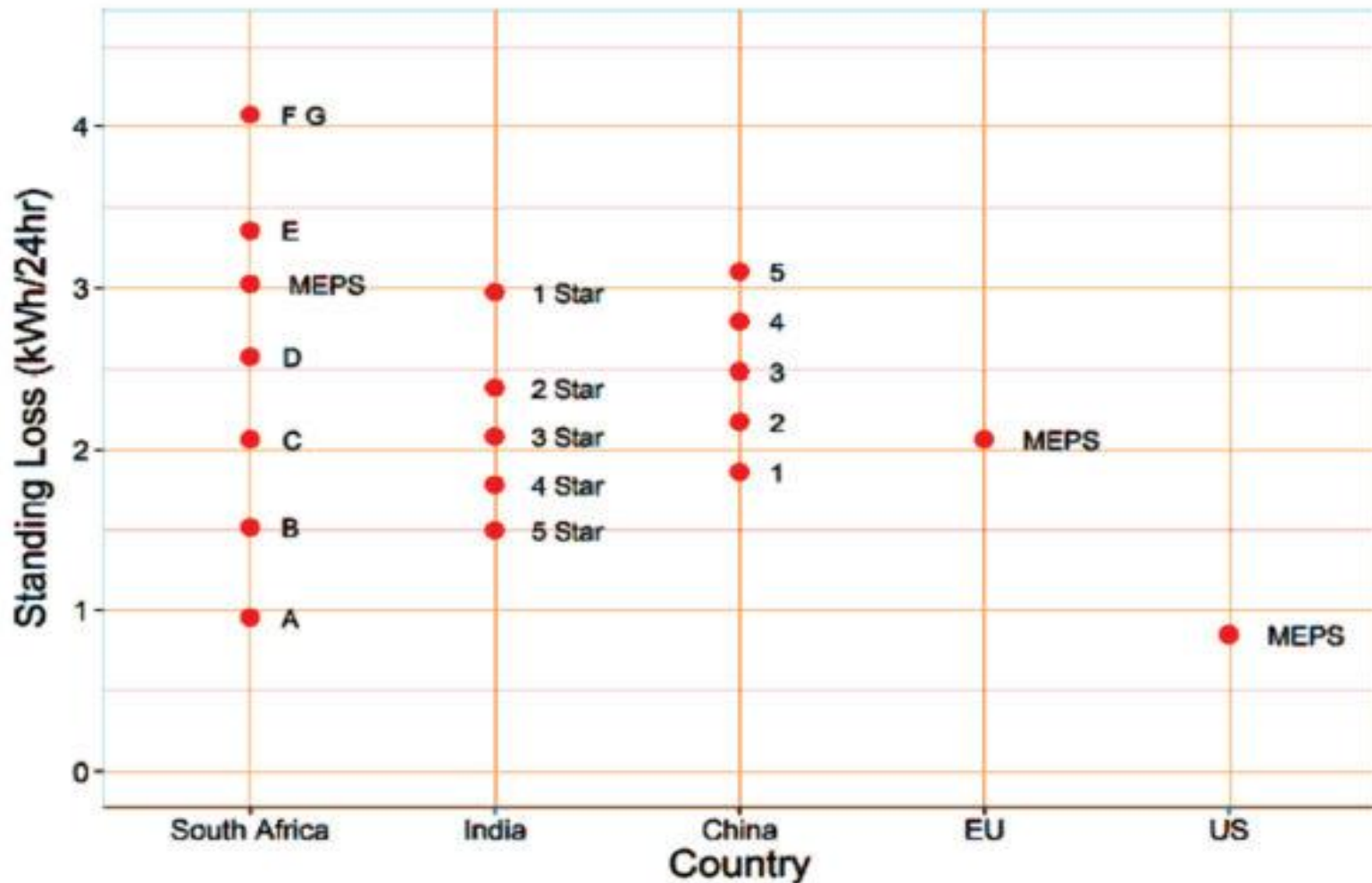
COMPLEXITY OF ENERGY PERFORMANCE TEST STANDARDS

Country	Test Parameters
European Union	Eight draw patterns. Separate standing loss test for hot water storage tanks
South Africa	48 hour standing loss test, ΔT 45°C
China	Standing loss test, ΔT 45°C
United States	Simulated use test, six draws at one hour intervals, ΔT 37.5°C

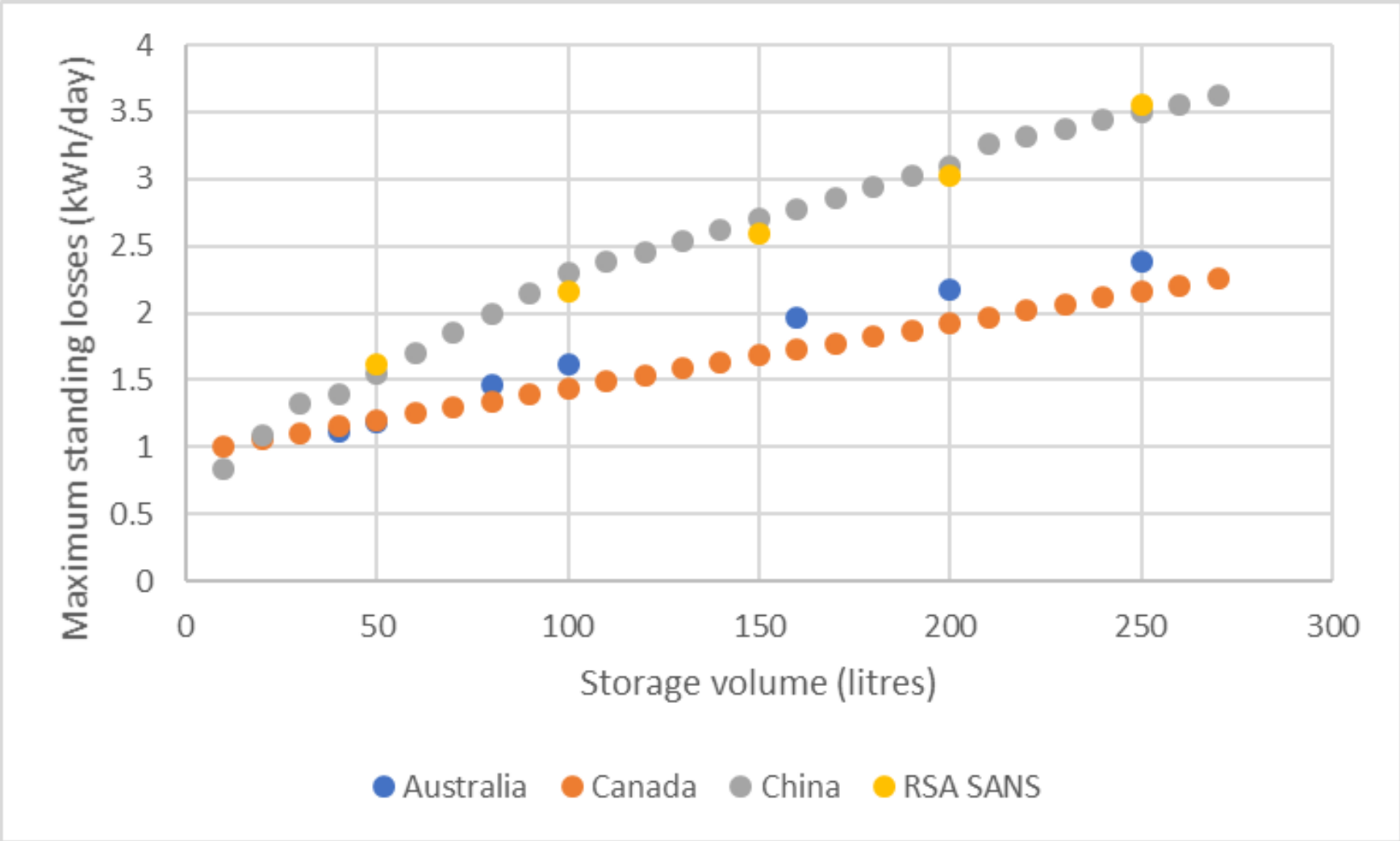
WATER HEATER MEPS - EXAMPLES

Country	Regulation	Status	Most recent effective date
China (PRC)	GB 21519-2008 Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Electrical Storage Water	Under revision	12/14/2011
European Union	Commission Delegated Regulation EU No 814-2013 of 18 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks	Entered into Force – under review	9/26/2015
South Africa	VC 9006	Entered into Force - No Activity	5/29/2014
Ghana	Draft MEPS for Electric Water Heaters	Under development	n.a.

COMPARISON OF POLICY MEASURES – MEPS & LABELLING AT 200 LITRES CAPACITY



COMPARISON OF POLICY MEASURES



TENTATIVE SCOPE FOR SAVINGS

MAIN IMPACTS IN 2035			Water heater		
			BAU	BAT	BAT vs. BAU
ENVIRONMENT					
	Electricity	TWh/year	13.43	4.16	-69%
	GHG	Mt CO2-eq./year	9.47	2.93	-69%
CONSUMER					
Region totals	Expenditure	Euro bln./year	1.90	0.99	-48%
	of that, purchase costs	Euro bln./year	0.45	0.54	20%
	of that, energy costs	Euro bln./year	1.46	0.45	-69%
Per product sold	Sales (regulated)	000	2 853	2 853	0%
	Product price	Euro	157.00	188.40	20%
	Energy costs	Euro/year	63.36	19.64	-69%



Chambre de Commerce et
d'Industrie de Côte d'Ivoire



Thank You