

Gearing up to meet Africa's
rising power and water demand



12 – 14 May 2015
Cape Town, South Africa



**AFRICAN
UTILITY
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**CLEAN POWER
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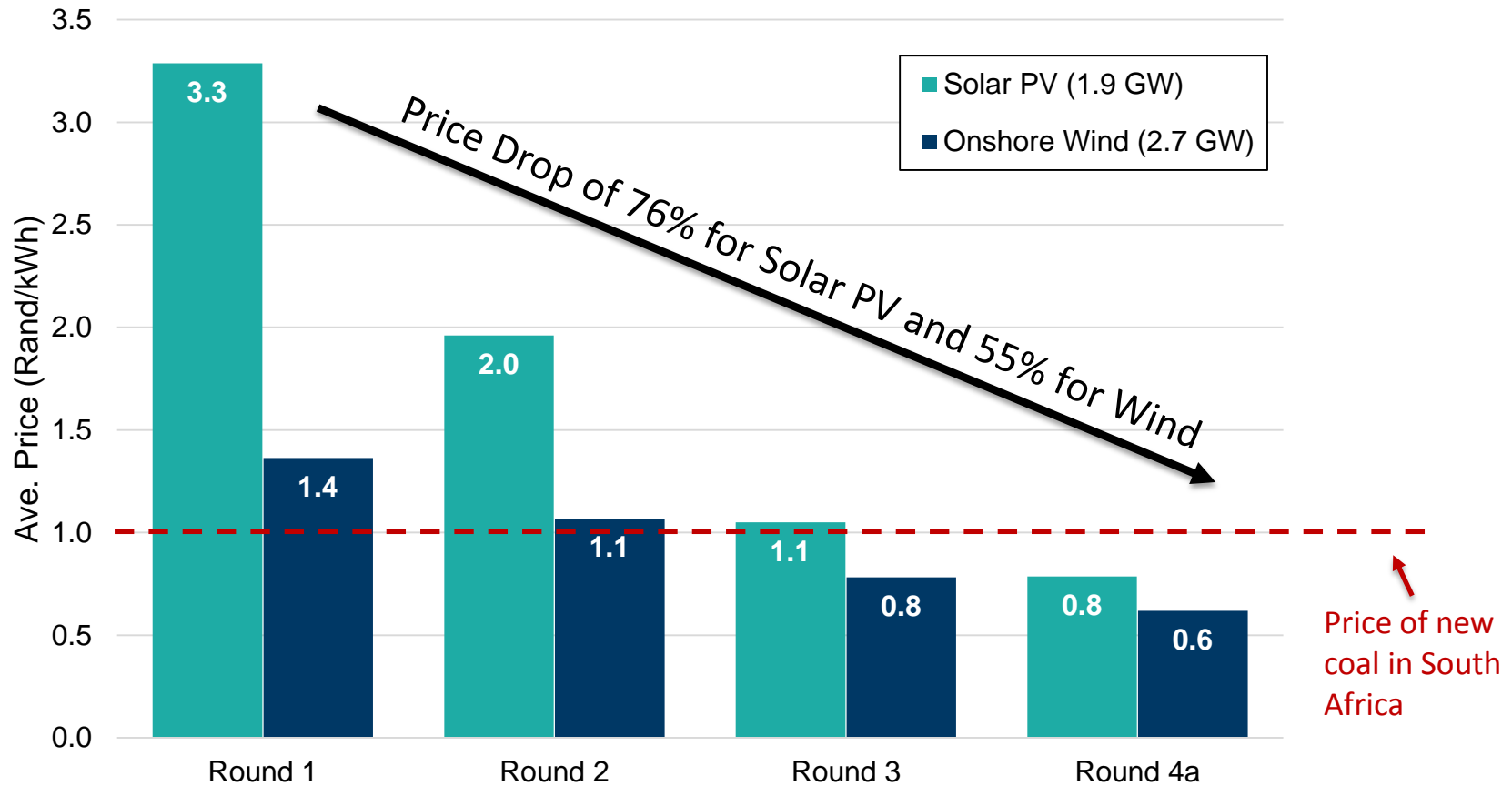
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Solar PV Business Case for Industrial and Commercial Customers in South Africa

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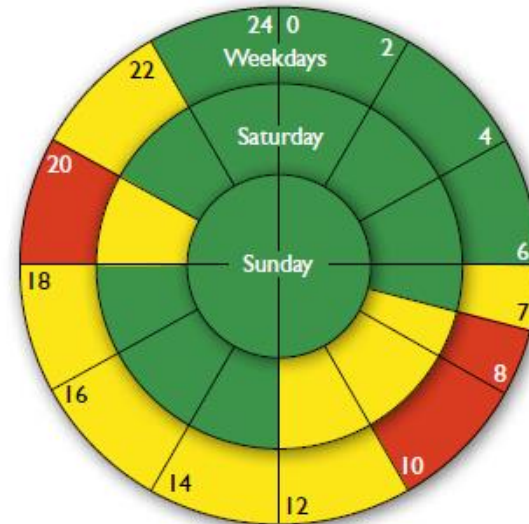
Dramatic price drop for South Africa's utility-scale renewable energy procurement program from 2011-2015 (*Indexed April 2014 Values*)



Customer tariff amounts and structure vary substantially among municipalities across South Africa

- South Africa has over 200 municipalities with unique tariff categories and charges
- Municipalities procure most electricity via Eskom and apply mark-up
- High variability in customer rates and structure (e.g. cross-subsidization, demand charges, time of use)

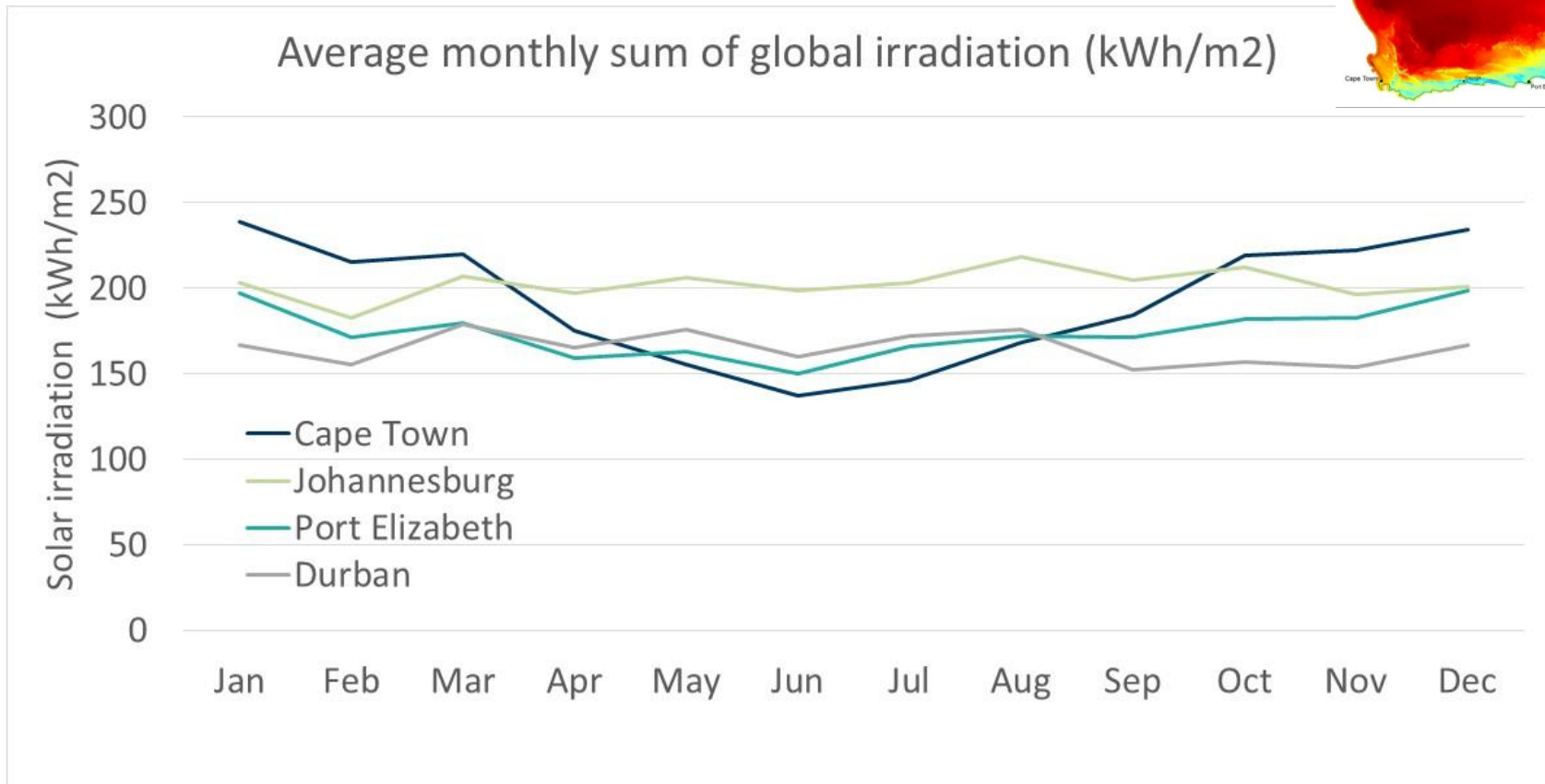
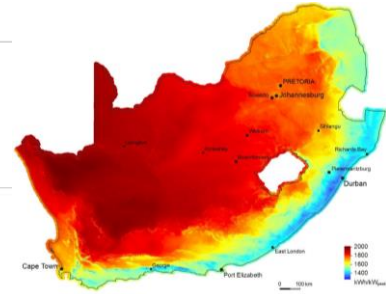
Eskom Megaflex Energy Charge¹ 2014/2015



TOU Period	Winter High Season Jun-Aug (Rand/kWh)	Low Season Sep-May (Rand/kWh)
Peak	2.3-2.7	.76-.87
Standard	0.7-0.8	.46-.52
Off-Peak	.38-.44	.29-.33

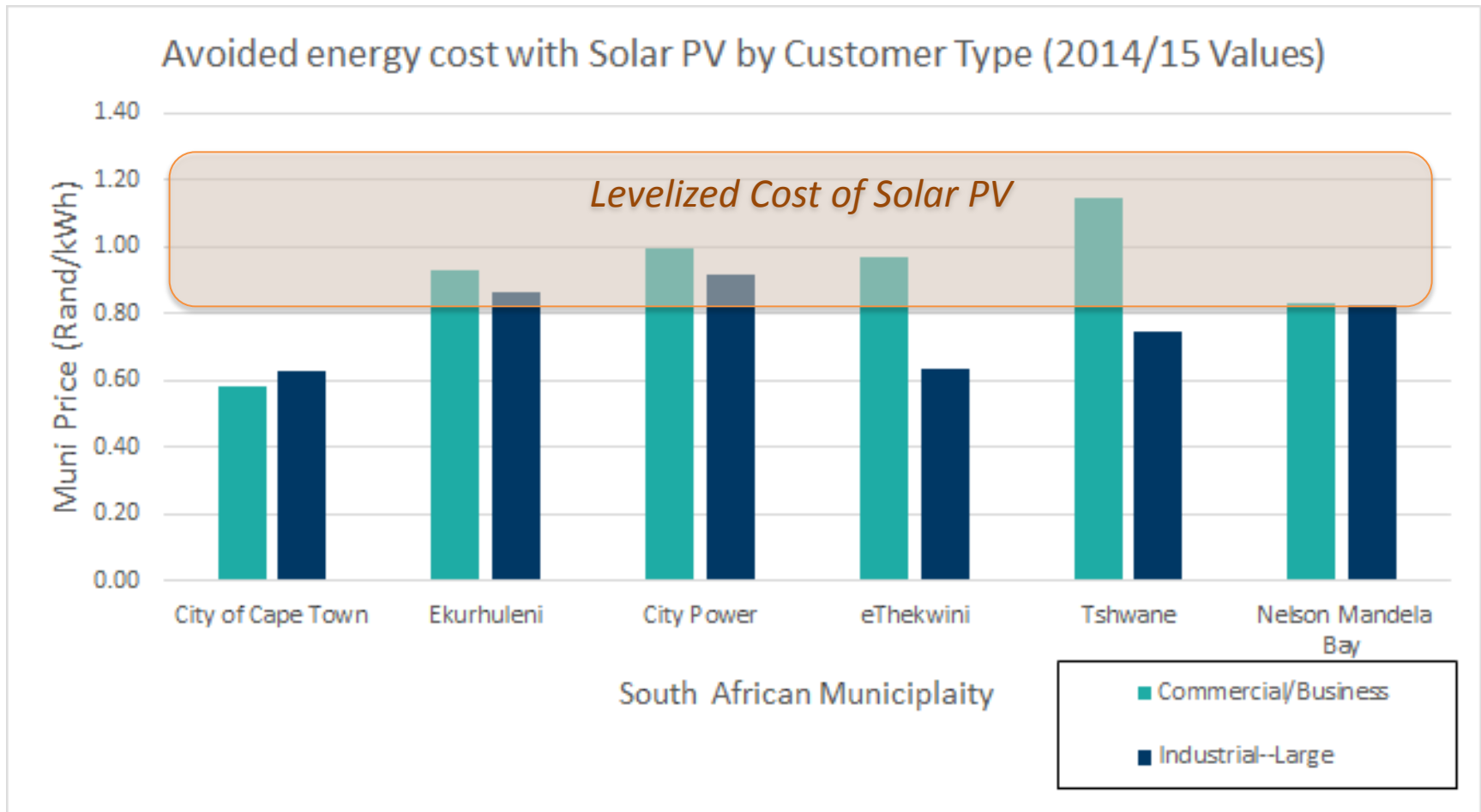
¹Note: Energy charge does not include T&D network, demand, reliability, subsidy, and other service charges;

Solar resource also varies across the country, informing the business case for customers.



Source: Helioclim-3 hourly measured data

Levelized cost of solar PV is currently cheaper than what some customers pay for electricity in South Africa

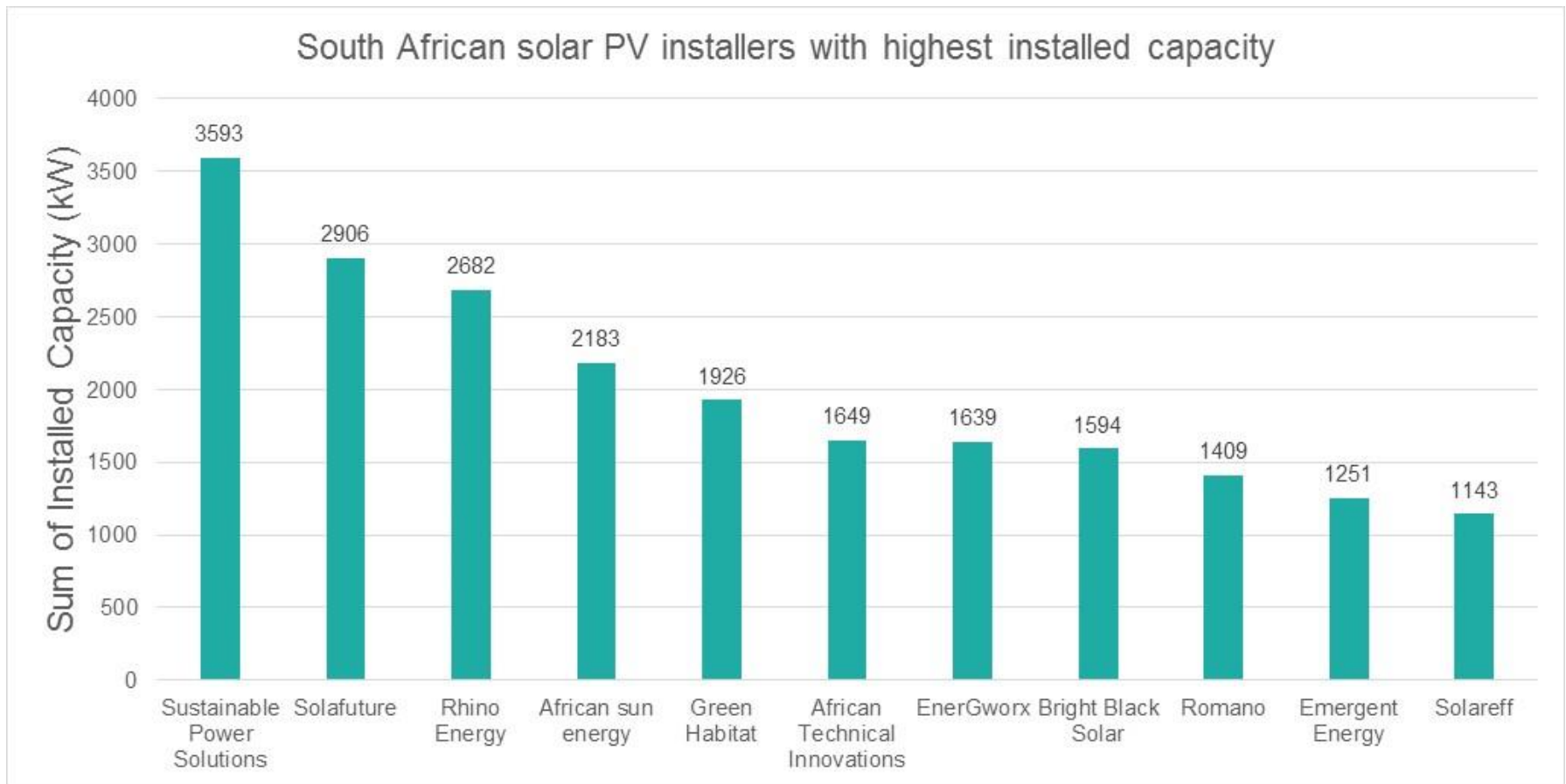


Most residential, commercial and industrial scale solar PV projects were installed in just the last few years in South Africa

South African Province	Total Installed Capacity (kW)	Number of known non-utility scale solar PV projects in South Africa				Total Projects
		>0 & ≤10 kW	>10 & ≤100 kW	>100 & ≤500 kW	>500 & ≤1,200 kW	
Western Cape	11,532	74	39	22	5	140
Gauteng	10,840	98	43	25	3	169
Kwazulu Natal	3,263	9	3	4	3	19
Limpopo	2,088	0	1	0	2	3
Unknown	1,761	1	11	4	0	16
Northwest Province	1,368	0	0	0	0	0
Free State	1,331	2	3	0	2	7
Mpumalanga	1,144	2	2	3	1	8
Northern Cape	668	2	3	0	1	6
Eastern Cape	445	15	8	0	0	23
Total	34,440	203	113	58	17	391

Note: Excludes 0 capacity rated projects. Updated as of May 1st, 2015; Source: <http://pqrs.co.za/s-a-solar-pv-list-2/>

South Africa's roof-top solar PV industry is growing quickly with over 50 unique installers who have experience in South Africa



Source: <http://pqrs.co.za/s-a-solar-pv-list-2/>

Several municipalities in South Africa now accept applications from embedded generators who wish to connect to the distribution network

- Nelson Mandela Bay (**Port Elizabeth**) requires the customer to pay 1/2 the cost for a new meter and effectively reimburses customers for excess solar PV at the **same rate it charges them**
- **City of Cape Town** reimburses customers for **~1/2 of what it charges** them and requires the customer to pay for smart meters
- EThekwini (**Durban**) is accepting embedded generation applications and is authorized to purchase electricity from embedded generators at **Eskom's Mega Flex rate**



Other factors which will likely improve the business case for solar PV in coming years

- South Africa's energy regulator (NERSA) set to finalize small-scale embedded generation regulatory rules by end of the May (Municipalities will need to comply)
 - Export tariff = avoided variable purchase cost of the distributor (~Eskom's ave tariff)
- Eskom plans to increase prices 13-25% this year followed by at least 8%/yr for the next 4 years
- Load shedding is a reality for South Africa for at least the next few years
- The energy storage market is forecasted to grow considerably in next few years
 - Battery costs are dropping (e.g. Powerwall battery from Tesla)

Important to consider all options available to customer when evaluating business case for Solar PV (e.g. energy efficiency typically has higher returns on investment)

Questions?

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