

CSP in South Africa

SolarPACES 1-A Plenary

Marrakech 2012

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Outline



- ① REIPP programme in relation to CSP
- ② CSP Activities under development by Industry
- ③ SASTELA Introduction and 2030 CSP Strategy Study
- ④ Role of CSP in South Africa

Integrated Resources Plan 2010

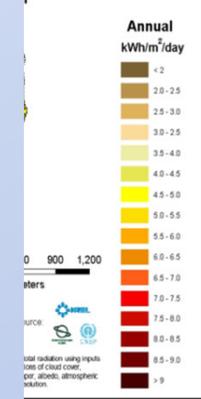
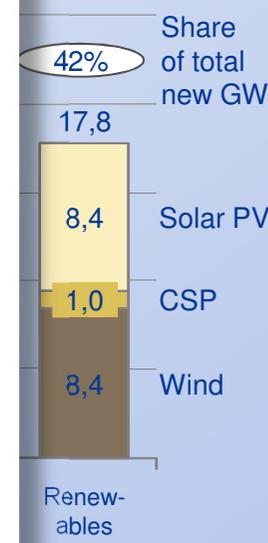


— typical Summer day DNI — typical Summer day demand

Policy-Adjusted IRP (Capacity)

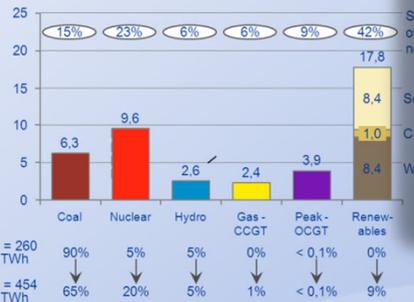
South Africa's renewable energy strategy driven by low-carbon objectives and priorities outlined in:

- South Africa's Long-Term Mitigation Scenarios (LTMS),
- Renewable Energy White Paper of 2003,
- National Energy Efficiency Strategy of 2009,
- Government's National Climate Change Response green paper of 2010,
- The New Growth Path Framework (2010),
- The Integrated Resources Plan (IRP) 2010.



Policy-Adjusted IRP (Capacity)

Total additional new capacity (without committed) until 2030 in GW



Energy share

in 2010 $\Sigma = 260$ TWh
in 2030 $\Sigma = 454$ TWh

90%
65%

5%
20%

5%
5%

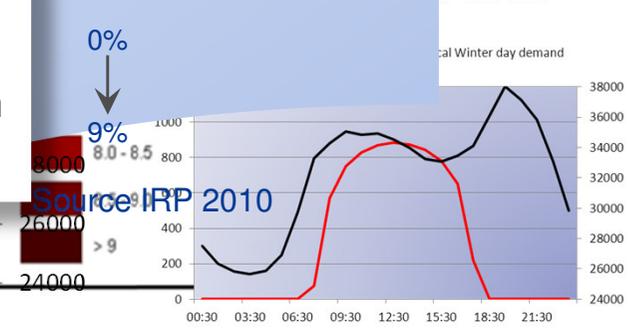
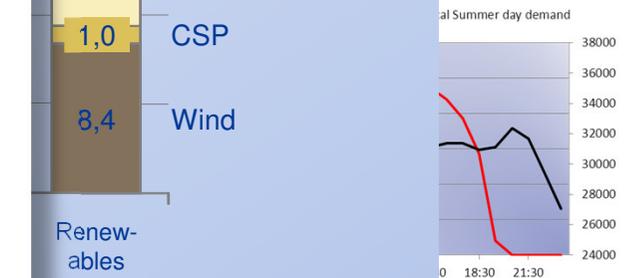
0%
1%

< 0,1%
< 0,1%

0%
9%

Source IRP 2010

00:30 03:30 06:30 09:30 12:30 15:30 18:30 21:30

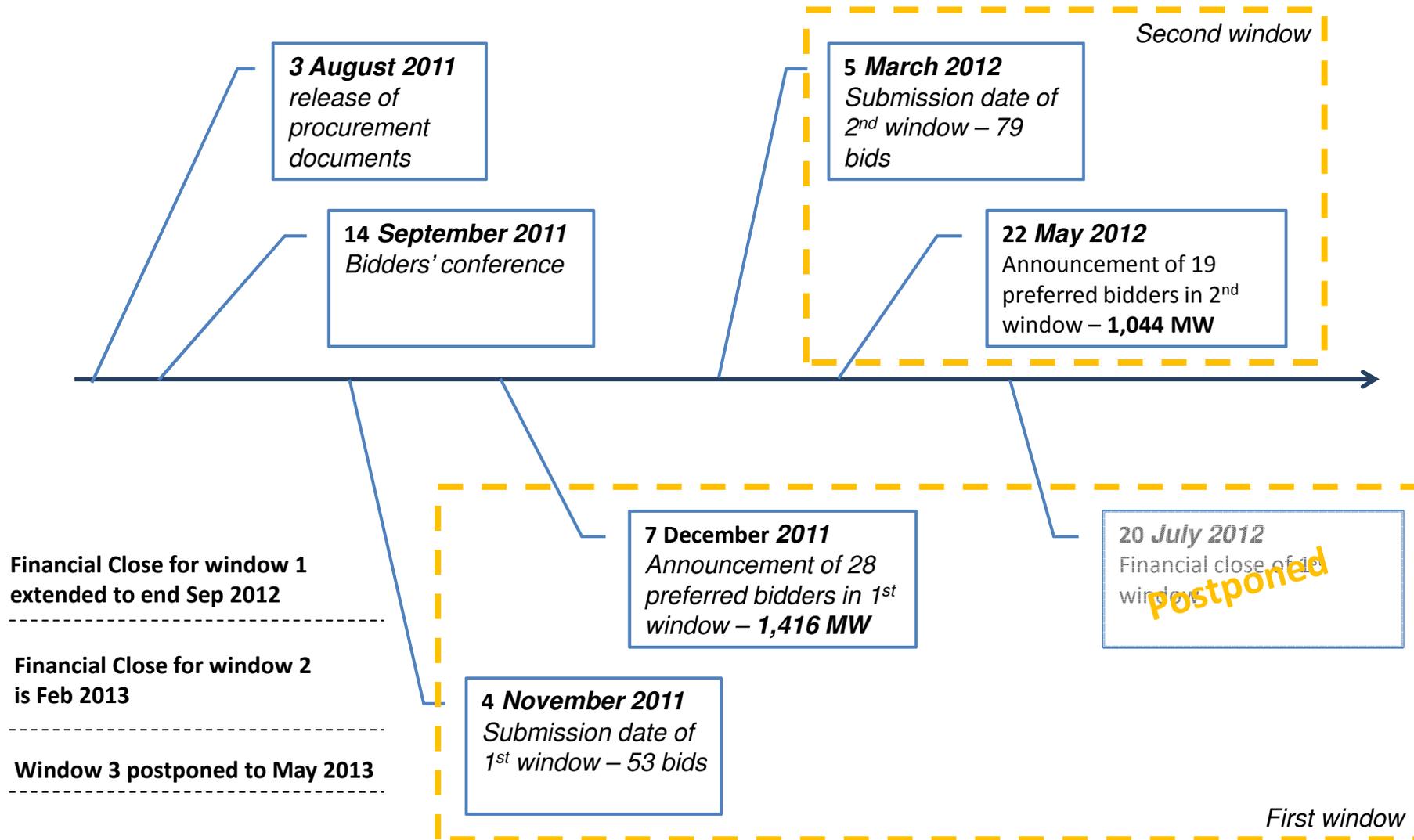


Is a **“living” plan**, which will be updated on an on-going basis to reflect the changing needs of South Africa and to learn from the market forces that influence changes in our economical, social and technological environment.

This is the first IRP that government directed and it seeks to **find a balance** between competing government objectives:

- Affordability**
- Reducing carbon emissions (*Towards a Green Economy*)**
- Water conservation**
- Localization and,**
- Regional development**

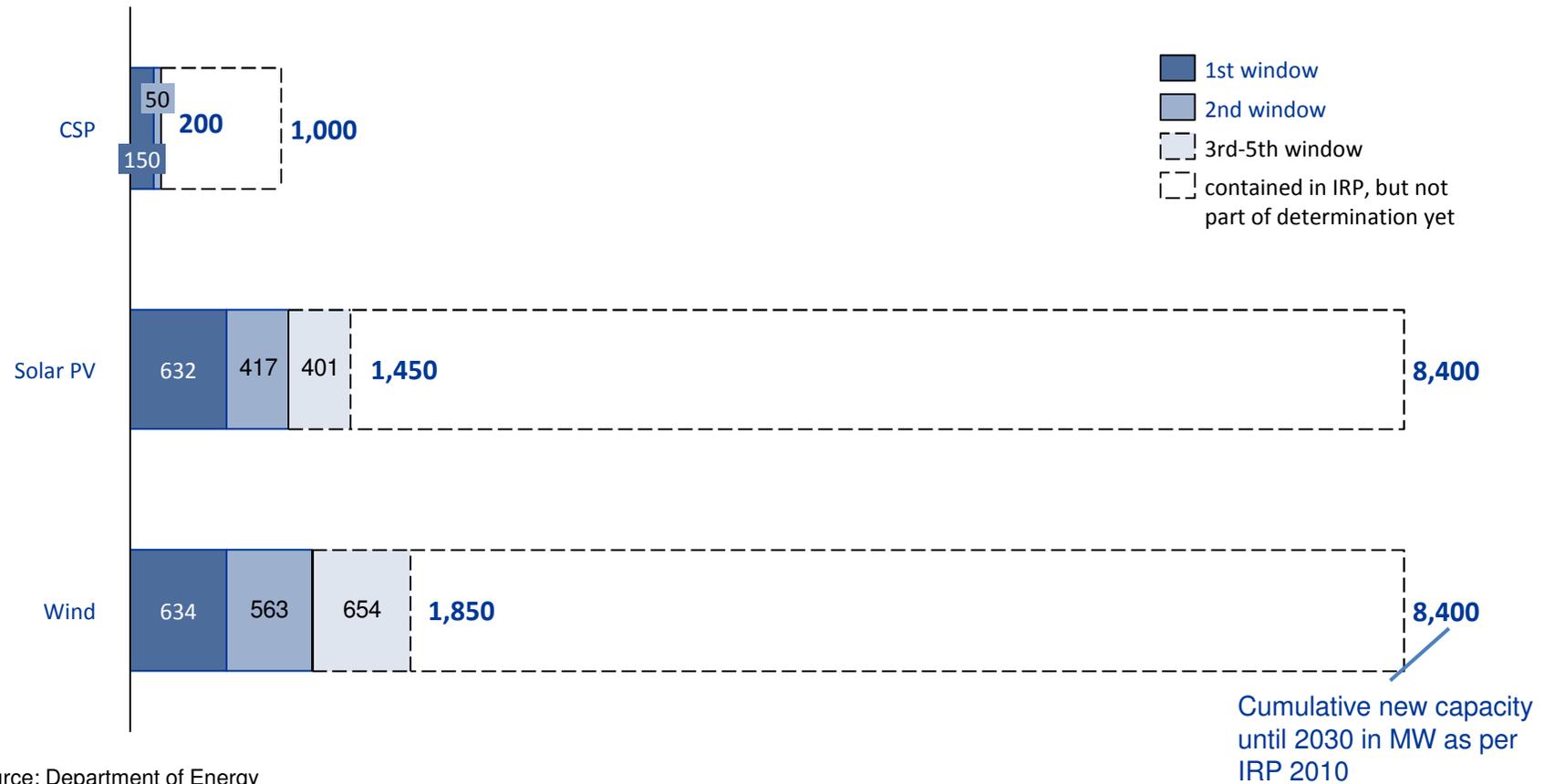
DoE allocated 3,725 MW of renewables to IPPs in up to five bidding windows



The DoE has so far approved procurement of 3,500 MW out of 17,800 MW of CSP, PV and wind in the IRP 2010

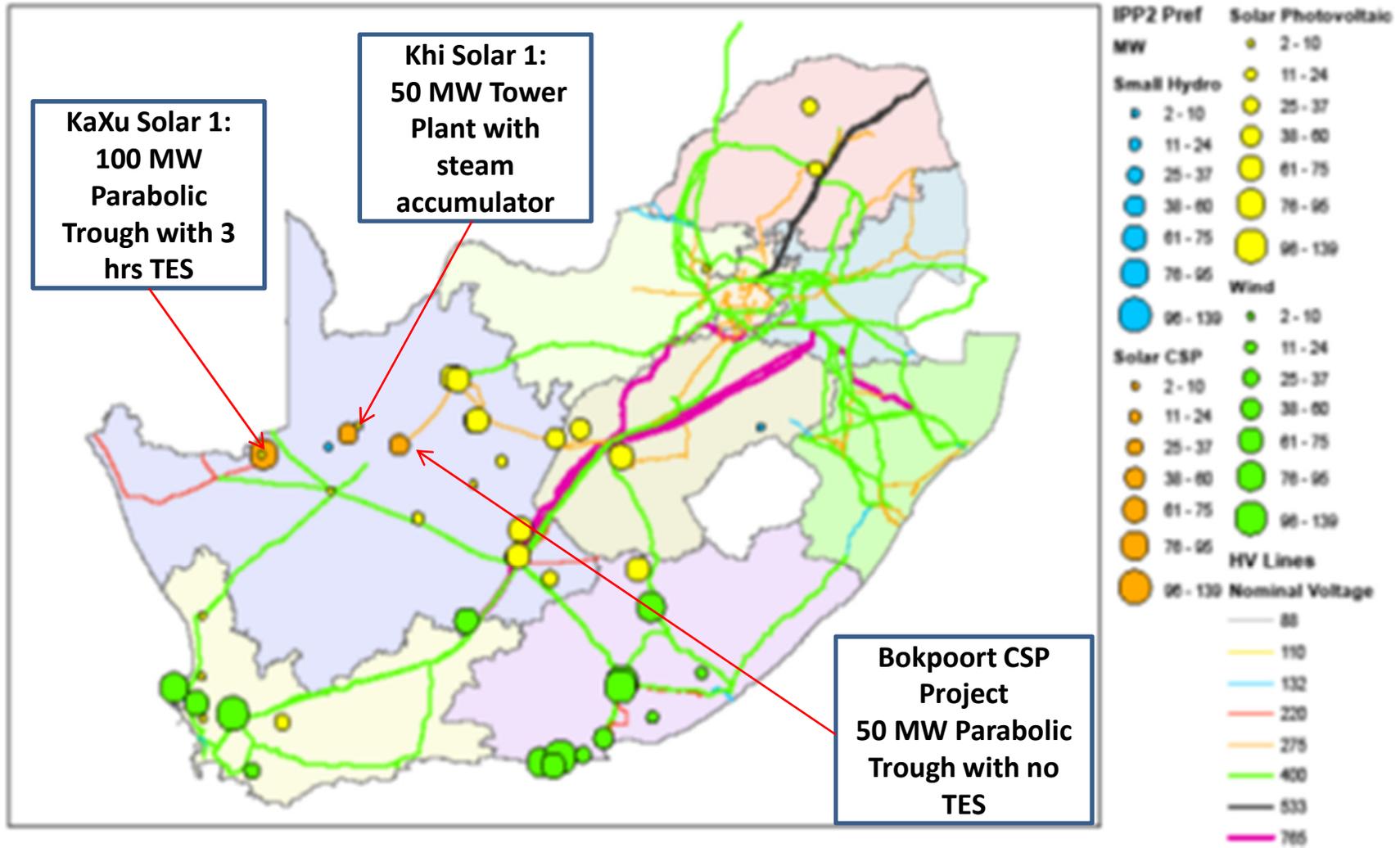


Allocation of IRP 2010 new capacities in first DoE determination

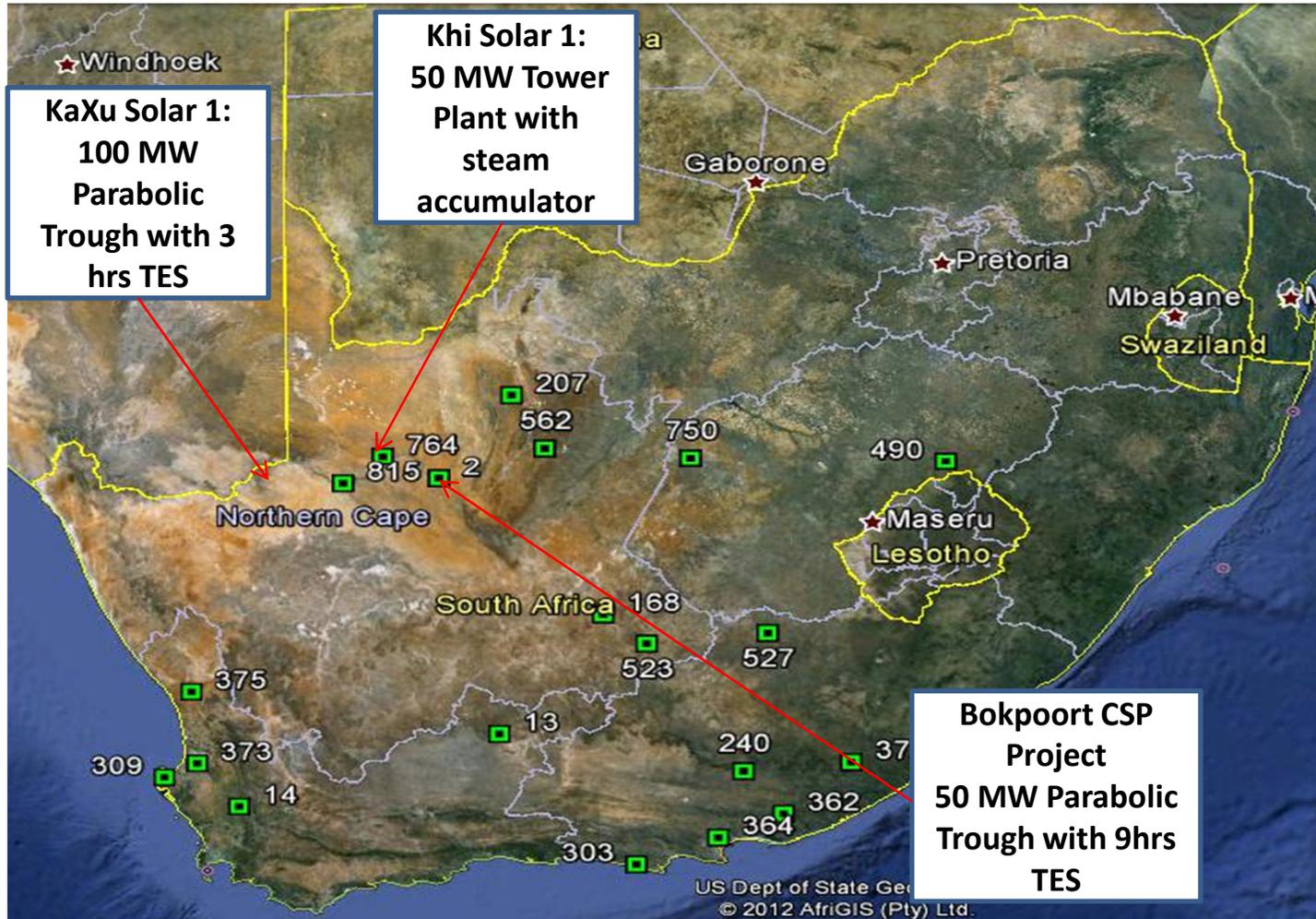


Source: Department of Energy

IPP Preferred Bidders Round 1 & 2



IPP Preferred Bidders Round 1 & 2



IPP Preferred Bidders Round 1 & 2



	Bid Window 2	Bid Window 1
Price: Fully Indexed (Ave Rand per MWh)	R 2 512	R 2 686
MW allocation	50 MW	150 MW
Total Project Cost (R'million)	R 4 483	R 11 365
Local Content Value (R'million)	R 1 638	R 2 391
Local Content %	36.5%	21.0%
Job Creation : Construction (People)	662	1 165
Job Creation : Operations (People)	50	70

Source: Department of Energy

Applications Received till March 2012



Technology	MW (Max)	%
Landfill	13	0.0%
CPV	30	0.1%
Biotherm	36	0.1%
Biogas	51	0.1%
Hydro	122	0.4%
Biomass	229	0.7%
Gas	332	1.0%
Steam	350	1.0%
Co-Gen	373	1.1%
CSP	1534	4.5%
Coal	4870	14.3%
PV	9606	28.1%
Wind	16615	48.6%
	34160	100%

SOLAR PV GENERATION AREAS



SOLAR CSP GENERATION AREAS



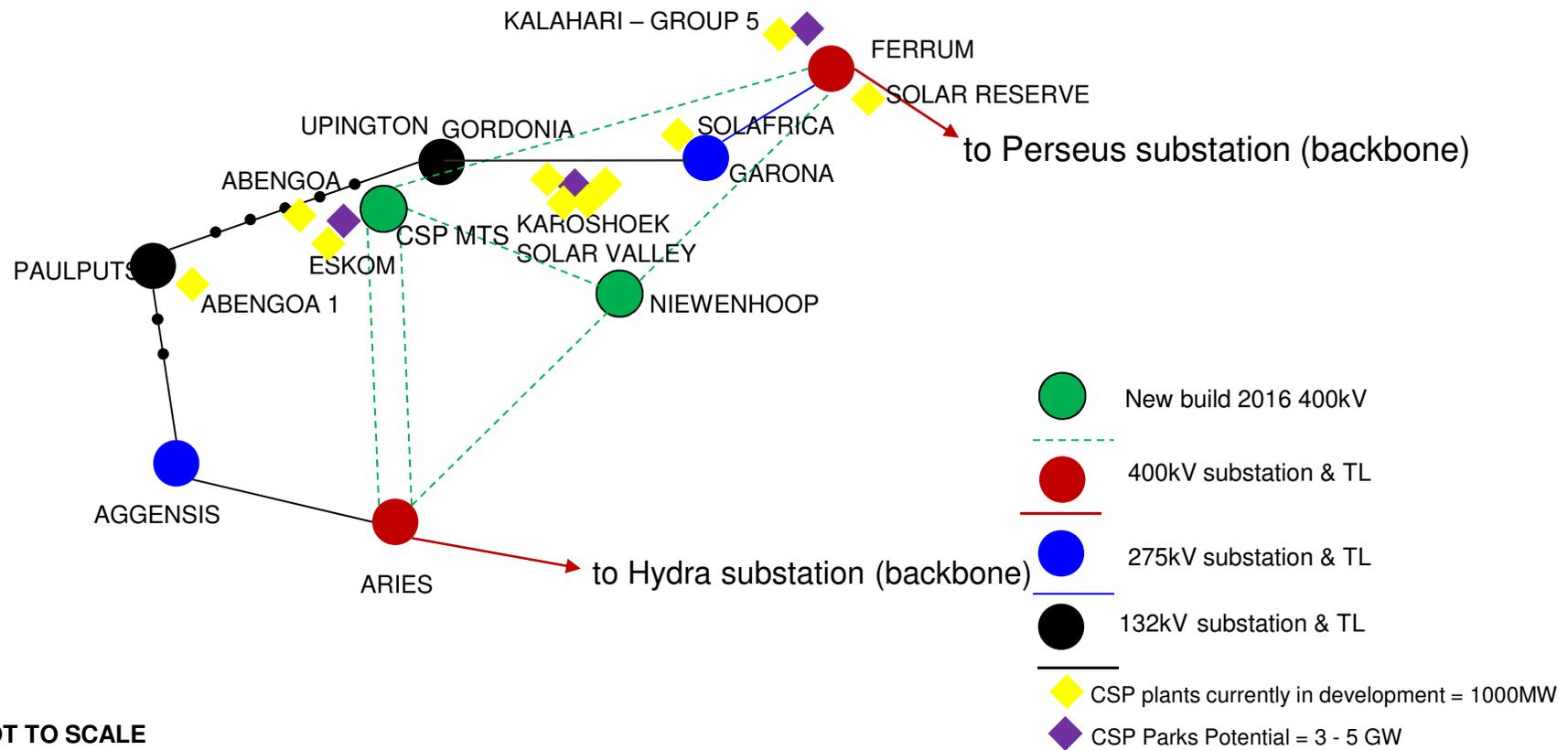
WIND GENERATION AREAS



Source: Department of Energy

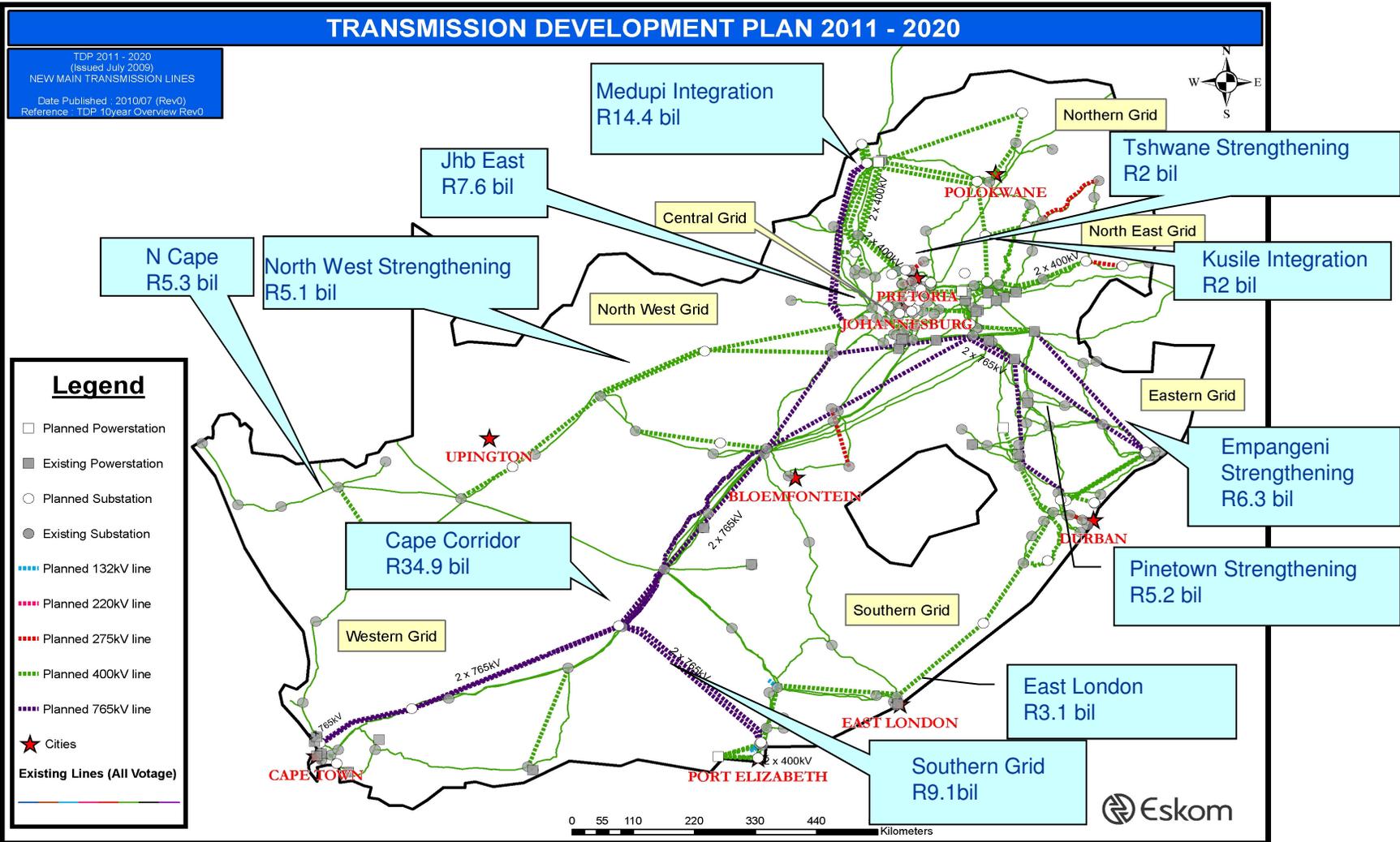
2.1: CSP Projects under development

- ❖ The Eskom transmission plan will allow the evacuation of power generated by future CSP plants in the Northern Cape Corridor, the corridor today has 3 potential CSP parks that can be developed with a 3-5 GW potential
- ❖ The following companies are involved in the development of CSP Thermal power plants in the NOCASCO HUB— Siemens, ABB, Solar Reserve, Group Five, Eskom, Abengoa, Emvelo, Solafrica, Sasol, Brightsource, Alstom



NOT TO SCALE

Eskom's Transmission Development Plan takes into account anticipated renewables capacities





Objective

Promote the roll out of CSP	For sustainable peak, mid merit and base load solar thermal electricity as well as the uptake of large scale industrial solar process heat.
Engage Policy Makers	At policy and administrative levels (local, national, regional & international).
Promote Local Manufacture	Promote the manufacture of CSP components in Southern Africa - SADC countries.
Promote CSP Value Chain	Promote excellence in the planning, design, construction and operating of CSP plants including research and innovation, vocational training and support for equal opportunities and transformation.
Sustainable Development	Participate and contribute to combating climate change, promote migration to a low carbon economy and sustainable development.
Demonstrate Job Creation	Promote the creation of new sustainable and green collar jobs in Southern Africa.
Regional Economic Development	Promote the SADC Desertec Concept (SADCTEC) and the use of the Southern Africa Power Pool (SAPP) for cross border transmission of solar thermal electricity.
International Co-operation	To work with NEPAD, the EU and other CSP stakeholders to promote the Africa-Europe grid interconnection concept by 2050.



- 1 Scenario 1**
 - Deploying 1,000 MW of CSP that are currently in the IRP to be deployed by 2020.
- 2 Scenario 2**
 - Deploying 5,000 MW of CSP by 2025 and 1,000 MW for the Southern Africa export market.
- 3 Scenario 3**
 - Deploying 10,000 MW of CSP by 2030 and 2,000 MW coming from hybridised plants with existing coal plants.
- 4 Scenario 4**
 - Deploying an additional 10,000 MW of CSP across the SADC region.

**Cost Reductions will come from economies of scale,
localisation, and research and development**

Role of CSP in South Africa



- 1 Economic growth engine** ✓
 - Supports local manufacture with potential to export skills and components

- 2 Job creation and skills development** ✓
 - Significant Direct, Indirect, and Induced jobs created with each CSP project.

- 3 Positive Impact on local communities** ✓
 - Job Creation, Infrastructure, education, poverty alleviation.

- 4 Positive Environmental footprint** ✓
 - Zero CO₂, particulates, NOX, and SOX emissions.

- 5 Enabler of S.A. Development through electricity for all initiative** ✓
 - Zero CO₂, particulates, NOX, SOX emissions.



1 Key drivers to RE success in South Africa

- Abundant and superior natural wind and solar resources
- Well defined long term RE portfolio policy
- Long term power demand at attractive prices
- Capacity to finance RE targets set by DOE
- Timely and cost effective access to transmission
- Effective “Public-Private Sector” partnership

2 South Africa is the best new RE market in the world

- One of the highest RE tariffs through transparent competitive process
- Eskom as credit worthy off-taker supports RE financing in SA
- No transmission and congestion risks
- Enabling environment including transparent competitive process
- Abundant opportunity for distributed RE generation also



CSP is a catalyst for change in South Africa

THANK YOU

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