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How2Guide for Bioenergy

South Africa - 29 & 30 April, 2014

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MANUFACTURERS ASSOCIATION OF SOUTH AFRICA (PAMSA)

“Biomass Resources and Business Case for Cogeneration”

+

“Barriers to Investment”

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Energy Consultant
Paper Manufacturers Association of SA
Director of IES Energy






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About PAMSA

- Formed in 1992
- Promotes the interests and efforts of the South African pulp and paper industry
- Members – Lothlorien, Kimberly-Clark, Mondi, Mpact, Nampak, Sappi
- Platform for the development of common views on pre-competitive industry issues – energy, environment, recycling, education, research etc
- PAMSA also oversees the efforts of:
  - Paper Recycling Association of South Africa (PRASA)
    - Promotes paper recycling in South Africa through increased education and awareness initiatives
  - South African Tissue Manufacturers Association (SATMA)





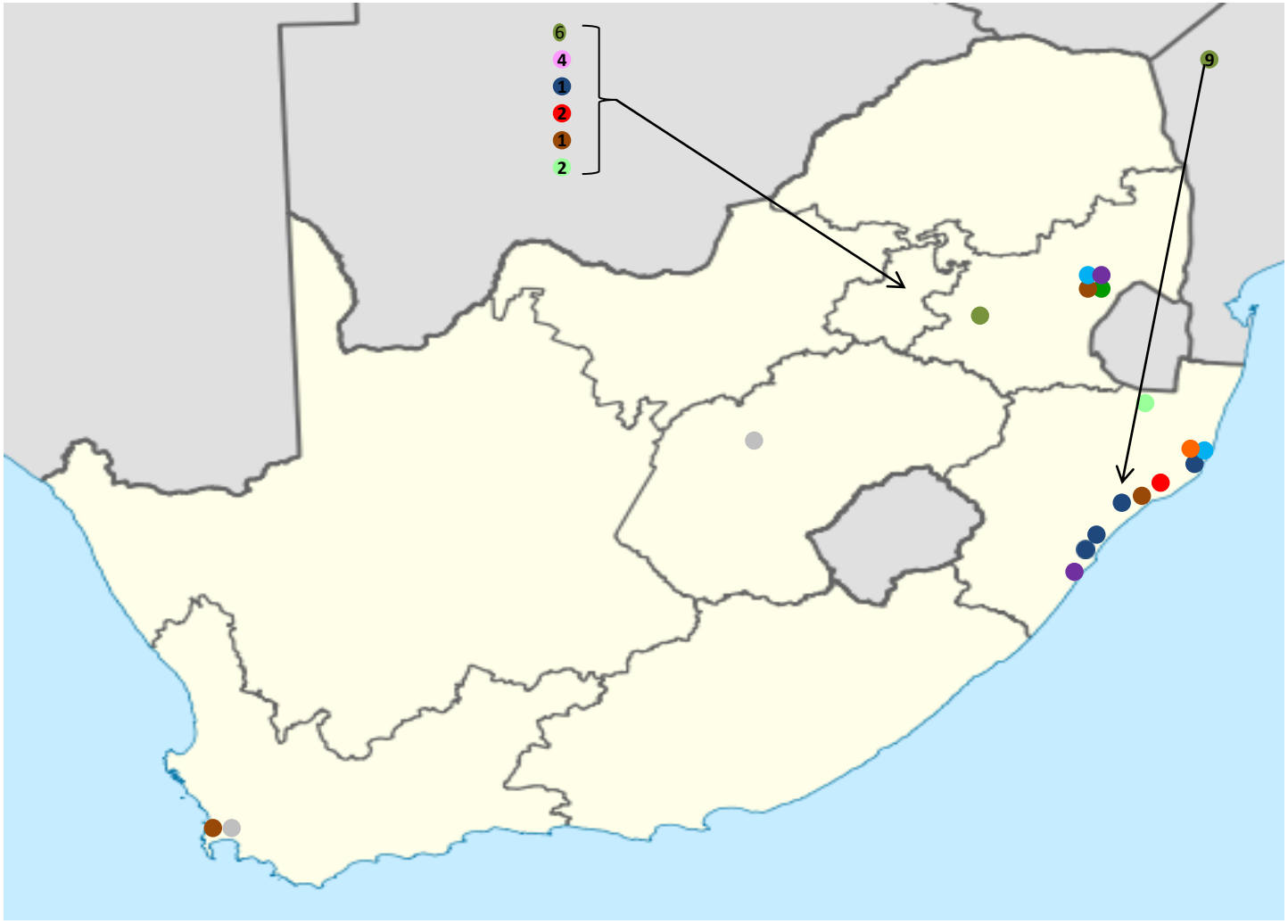

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SA Forest Products Industry

- 600 million trees across 1.275m hectares are grown for use in pulp and paper manufacture.
- These trees sequester carbon and mitigate climate change.
- Industry plants in excess of 260,000 trees every single day.
  - All paper in South Africa is produced from plantation-grown trees, recycled paper or bagasse (sugar cane fibre).
  - Fibre is not sourced from the wood of rainforests, indigenous or boreal trees.
  - Highest level of FSC certification in the world
- Use of renewable biomass-based energy has enabled the industry to avoid the use of 1,3 million tons of fossil fuels annually and associated carbon emissions.
- Significant employer of over 140,000 people.
- R 1.654 bn balance of trade and 0.6% of GDP in 2012.
- Contributes to jobs in rural areas, foreign exchange earnings and GDP growth.
- Continued investment in roads in deep rural areas, clinics, hospitals, schools and community development.

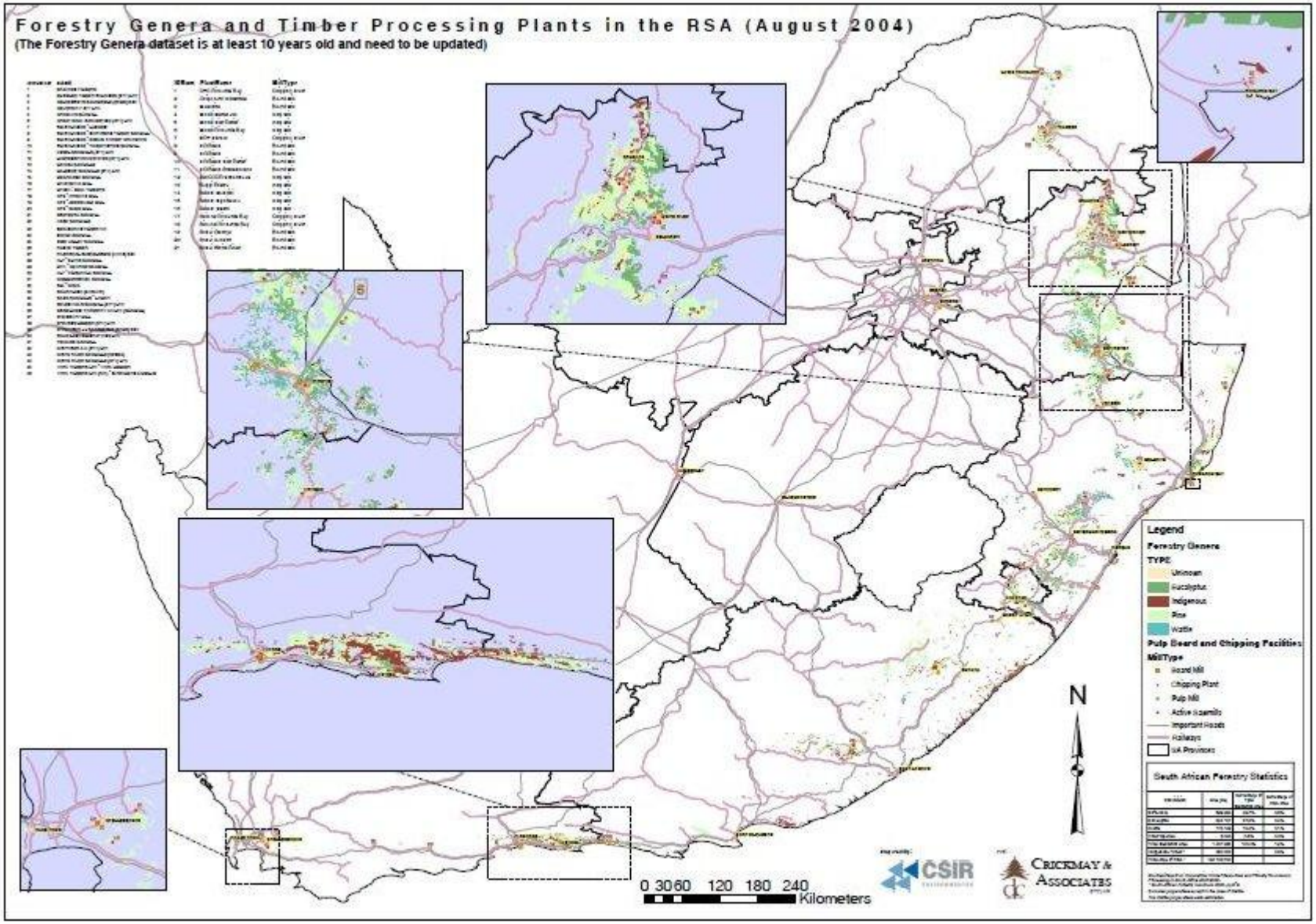
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Paper, Pulp, Chemical and Tissue Mills in South Africa



- Paper (5)
- Paper Board (3)
- Newsprint (2)
- Kraft (4)
- Pulp (2)
- Chemical Cellulose (2)
- Packaging Paper (3)
- Packaging Board (5)
- Liner Board (1)
- Tissue (18)

Forestry Map



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BIOMASS POWER POTENTIAL FROM SA COMMERCIAL TIMBER RESOURCES

- Assumptions of Yields of Biomass:

	Product (%)	Residue (%)
Sawmills	50	50
Pulp Mills: Softwood	89	11
Pulp Mills: Hardwoods	92	8
Mining Timber	75	25
Pole Producers	75	25
Plantation Residue		33






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BIOMASS POWER POTENTIAL FROM SA COMMERCIAL TIMBER RESOURCES

Species	Sawlogs	Poles	Mining Timber	Pulpwood	Totals
Sales from Plantations	**m3**	**m3**	**tons**	**tons**	**MW**
Softwoods	4,145,537	-	-	3,421,600	
Hardwoods	229,262	456,663	430,788	6,974,780	
Power Generation Potential MW					
Softwoods	195.6	-	-	80.7	276.3
Hardwoods	13.5	18.8	16.9	193.7	242.9
Total	**209.1**	**18.8**	**16.9**	**274.4**	**519.2**

REFERENCES

1. "Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa, 2008/2009“ (Compiled on behalf of the Directorate: Forestry Technical and Information Services, Department of Agriculture, Forestry and Fisheries, Forestry Branch, SA Government.)
1. "The Handbook of Biomass Combustion & Co-firing", Sjaak van Loo and Jaap Koppejan, Earthscan Publishing, 2008.
2. Private communications with Sappi, Mondi and SSA.

Industrial Biomass = Cogen in SA

- RE-IPPP biomass is for virgin biomass only
- Condemned to < 30% thermal efficiency through condensing power configurations
- Biomass associated with industry has been lumped in “Cogeneration”.
- Ministerial Determination – Dec 2012:

  “ 800 MW from Industrial Cogeneration energy sources which.....may include...biomass, industrial wastes and CHP”






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Some Basics – Cogen in SA

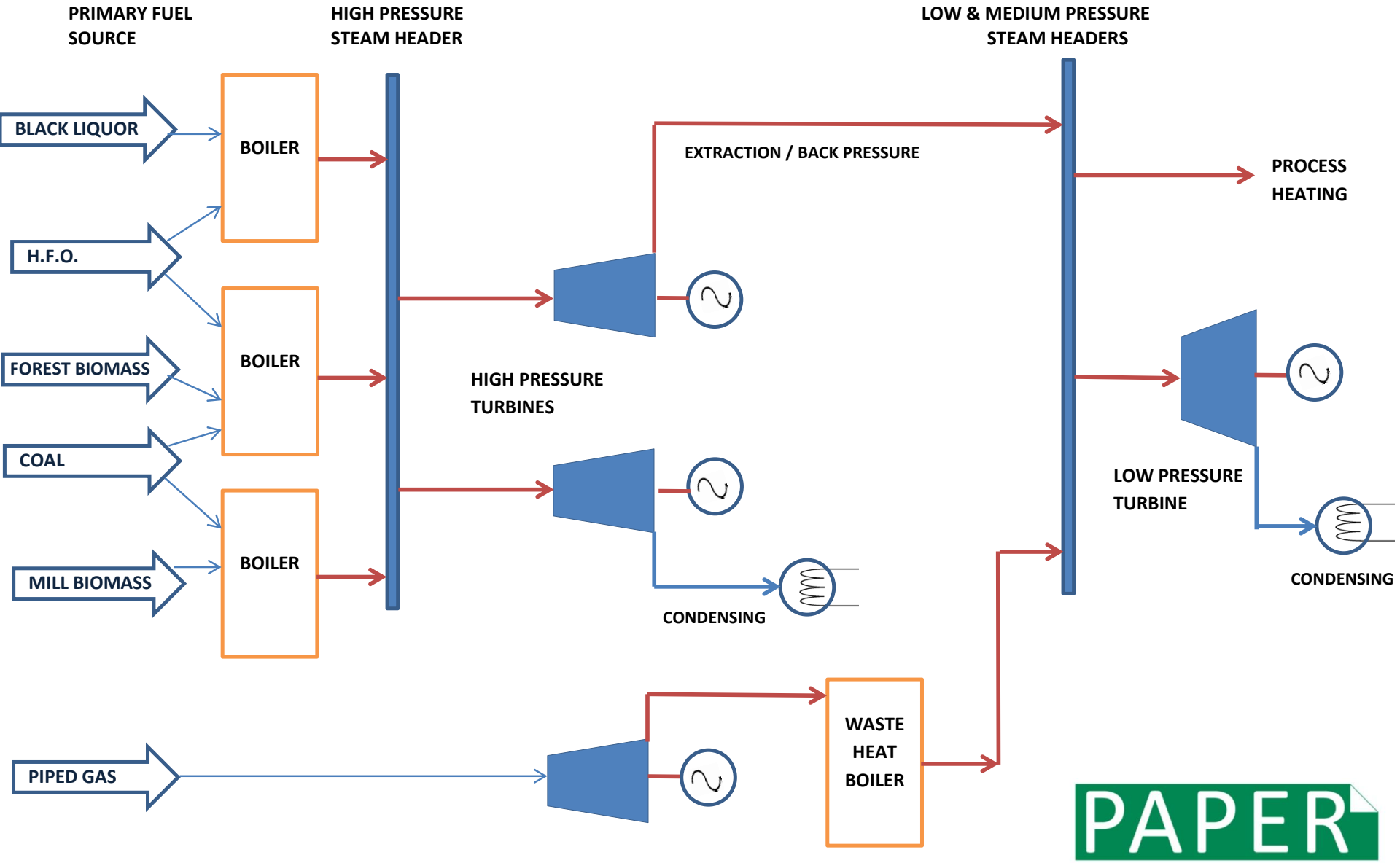
- Renewable, industrial biomass
- Bagasse, bark, chip, pulp mill residuals, black liquor, sludges etc
- Combined Heat and Power
- Renewable and non-renewable primary fuels
- Waste heat and waste fuels
- CHP requires a heat demand from a process
- Industrial condensing power ?






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Typical Pulp and Paper IPP

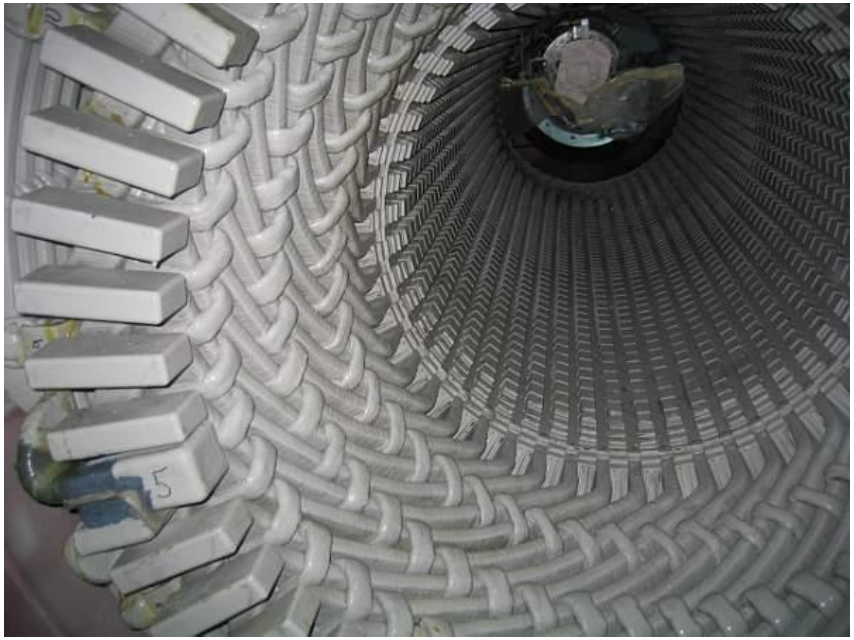


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Existing PAMSA Power Generation in SA







Turbo - Generators

1 Gas Turbine + WHB

16 Steam

6 sites

350 MW

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Biomass & Cogeneration – What can we do?

PAMSA Members' Project Opportunities

Characteristic	MW	Number
Projects	390	17
Condensing Power	257	12
Cogeneration Power	133	11
New Boilers	223	8
Refurbished Boilers	63	2
Existing Boilers	104	7
New Turbo Alternators	361	15
Renewable Fuels	371	13
Non-Renewable fuels	19	6
Start within 12 months	71	3
Start within 24 months	87	7

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Biomass



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Biomass in the Pulp and Paper Industry

Biomass – It is as renewable as the wind and the sun with the added advantage of quick access to the Grid, high load factors and the potential job creation in the biomass supply industry.

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Biomass = Solar + Value





Renewable and Forest Stewardship Council (FSC) Certified









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Biomass collection, conditioning and transport to Plant

Source: "Assessments of Forestry Biomass Availability" *C. Swart, April 2010*

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Business Case for Biomass & Cogeneration

Ticks the following boxes:

Criteria	
Certified as fully renewable	√
Base load and predictable 24/7/364	√
High load factors of > 85%	√
Rural and at the end of the Tx lines	√
Existing infra structure	√
Rural, sustainable jobs	√
Established, credit worth IPP developers	√
Compete with Eskom New Build	√

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Biomass & Cogen – What Barriers?

Knock, Knock, New Power!



NO ENTRY

- *Buyers*
- *National Procurement*
- *Incentives*
- *NERSA licensing*
- *IRP 2010*
- *Wheeling*



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Biomass & Cogeneration – What Barriers?

- **Need a buyer:-**
  - Eskom – short term sales only (STPPP)
  - Eskom – DOE & NT National Procurement
  - Private buyer in wheeling arrangement
- **National Procurement:-**
  - NERSA and COFIT history
  - Last serious National procurement in 2008.
  - 2 RFI exercises in past 24 months
  - Cogen procurement in 2014.
  - Min Martens press statement in April

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Biomass & Cogen – What Barriers continued..

- **Incentives Required**
  - Can't compete against Eskom
  - New boilers and turbines
  - Forest collection and transport
  - Indexation for fuel and labour costs
- **Legal and Regulatory**
  - NERSA generator licensing
  - IRP 2010 Update
  - Wheeling uncertain and risky
  - Municipalities cannot buy (NGR of ERA)
  - Own use only – offset subsidised Grid
  - Allow competition vs new power

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Biomass &Cogeneration – What Barriers?

LAWS:-

Electricity Regulation Act –

Section 10 (2)(g) "...evidence of compliance with any integrated resource plan applicable.....or reasons for deviation....“

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NATIONAL ENERGY REGULATOR OF SOUTH AFRICA

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Enquiries :
Tel :
Fax :
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Our ref :

xx June 2013

Mr xxxxxxxxxx
Head of Energy
xxxxxxxxxxx
xxxxxxxxxxxxxxxx
xxxxxxxxxxxx
xxxxxx

Dear Mr

APPLICATION FOR AMENDMENT OF XXX LTD'S GENERATION LICENCE

The National Energy Regulator of South Africa (NERSA) hereby acknowledges receipt of your application for an amendment of your generation licence on 3 June 2013.

The following outstanding information is required before NERSA can start processing your application:

- Fuel supply agreement; and
- Reasons for deviation from the Integrated Resource Plan (IRP2010).

Please note that in terms of the Electricity Regulation Act, 2006 (Act No. 4 of 2006)('the ERA'), the Energy Regulator is obliged to make a decision on the application within 120 days from the day all required information is submitted.

Yours sincerely

xxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxx

Regulator Members: Ms C Khuzwayo (Chairperson) Mr MJ Lesejane (Deputy Chairperson) *Ms P Nzimande (Chief Executive Officer)
*Mr T Bukula *Dr RD Crompton Mr O Komane Ms KR Mthimunye Ms GN Whittington Banda
*Full-time Regulator Members

NERSA is a Regulatory Authority established in terms of the National Energy Regulator Act, 2004 (Act No 40 of 2004)

IRP 2010 – Table 3

Table 3: Policy Adjusted IRP

New Build Options

	Coal (PF, FBC, Imports	Gas CCGT (natural gas)	OCGT (diesel)	Import Hydro	Wind	Solar PV	CSP	Nuclear
	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	300	0	0
2013	0	0	0	0	0	300	0	0
2014	500	0	0	0	400	300	0	0
2015	500	0	0	0	400	300	0	0
2016	0	0	0	0	400	300	100	0

Extract from Staatskoerant, 6 Mei 2011, No. 34263 17

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Biomass & Cogeneration – Conclusions

- **National Cogeneration Procurement:-**
  - Speedily move from talk to action
  - Meet the needs of IPPs
- **Remove Barriers to Investment**
  - DOE action on regulations & IRP Update
  - NERSA more supportive of IPPs
  - Support wheeling and cut costs
  - Bold and clear national plan for > 2000 MW

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How2Guide for Bioenergy

Needs to :

- Recognise Biomass/Cogeneration relationship in SA
- Build on existing initiatives – RE-IPPP, IRP etc
- Recognise that SA is power poverty trapped.
- Engage stakeholders
- Recognise market forces – speed, direction and result
- Result in a Roadmap for Bioenergy that:
  - Publishes and updates a plan
  - Makes National procurement predictable
  - Removes the numerous barriers
  - Releases the constraints on the power market
  - Pursues our numerous opportunities.






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THANK YOU

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