Renewable Energy
Electricity from Sugar Cane Fibre in South Africa and Region

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Renewable Electricity from Sugar Cane Fibre

Included in Draft IRP 2010 as an TECHNOLOGY CHOICE

- No general renewable energy option before 2020
- Potentially an option under MTRM Plan
- No certainty on timing as currently drafted

Include incremental annual capacity of 150 MW electricity from sugar cane fibre biomass from 2013

- On the same basis as wind and solar are included from 2014 and 2016 respectively.
- Enables cumulative implementation of 1000 MW allocation by 2020

Renewable Energy from 2020

- RE allocation should be more than sum of RE before 2020
- RE to increase over time consistent with new supply and externalities
- Substantial potential of region to be considered at next IRP review

Motivation - Can be and needs to be implemented now

International Trends – Sugar and Energy from Cane

- Essential part of electricity supply mix in developing countries
- Essential part of sugar cane agro-processing value chain

Renewable Energy Electricity from Sugar Cane Fibre

- Sugar cane season matches peak winter demand
  - "dispatchable" power
  - Operated as "base load" and "follow" daily demand curve
  - Sugar cane fibre fuel can be stored
  - RE fuel supply can be supplemented with other biomass
- Able to respond to medium term supply gap
  - Part of National Emergency Response Plan - now MTRM Plan
  - Participated in RFI for renewable energy
- Matches IRP criteria exceptionally well

Motivation - Can be and needs to be implemented now

Matches IRP criteria exceptionally well

1) Near zero additional carbon dioxide emission
   - Utilises existing renewable fuel efficiently
2) Cost effective renewable energy option
3) Incremental water consumption low
   - Integrated with sugar mill
4) Uncertainty low
   - Established industry implementing established technology
5) Builds on established high localisation
   - About 80% of capital value manufactured in South Africa
   - One of the most employment intensive industries
6) Establishes base for substantial regional development
   - Regional potential exceeds 10% of electricity demand of SA

Motivation - Can be and needs to be implemented now

Policy Priorities

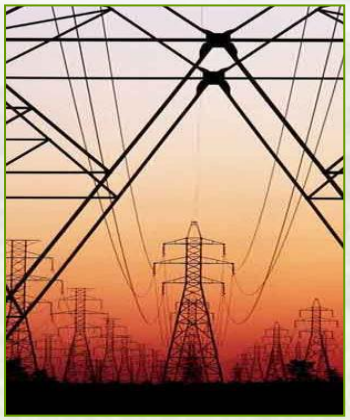
- The Ten Point Plan - Medium Term Strategic Framework (MTFS) 2009 – 2014
  - Thriving sugar cane industry based on sugar, electricity and ethanol
  - Strongly aligned with all 10 priority areas
- Most labour intensive energy supply
- Secures and expands rural sugar cane economy in
  - Eastern Cape
  - Kwa-Zulu Natal
  - Mpumalanga
- Effective in terms of trade
- Improves food supply – utilises existing bagasse as fuel
- Synergistic with fuel ethanol from sugar cane

Sugar Cane Industry Trends

International –

Permanent Structural Change

- Worlds two largest cane producers, Brazil and India, enjoy access to sugar, electricity and ethanol markets
- Brazil ethanol dominant
  - 60% of sugars to ethanol
- India electricity dominant
- Number of sugar cane industries transforming to co-produce sugar, ethanol and electricity
- Sugar only industries are becoming uncompetitive



Global Renewable Energy – Electricity Trends

India

Renewable Energy Electricity excluding Hydro-Electricity		
Year	Capacity	Contribution to country
2001	1 300 MW	1,2%
2010	15 600 MW	9,7%

- Electricity from bagasse
  - started in 1995
  - 2010 capacity 3 000 MW
  - 2015 target 10 500 MW
  - traded bagasse value 400 R/ton – equivalent to 115 R/ton cane

Brazil – 60% growth in electricity from sugar cane over last 10 years

Year	Bagasse Electricity	Contribution to country
2000	100 MW	0,1%
2010	3 500 MW	4%
2015 Target	15 000 MW	15%

Sugar Cane Industry Trends

South Africa

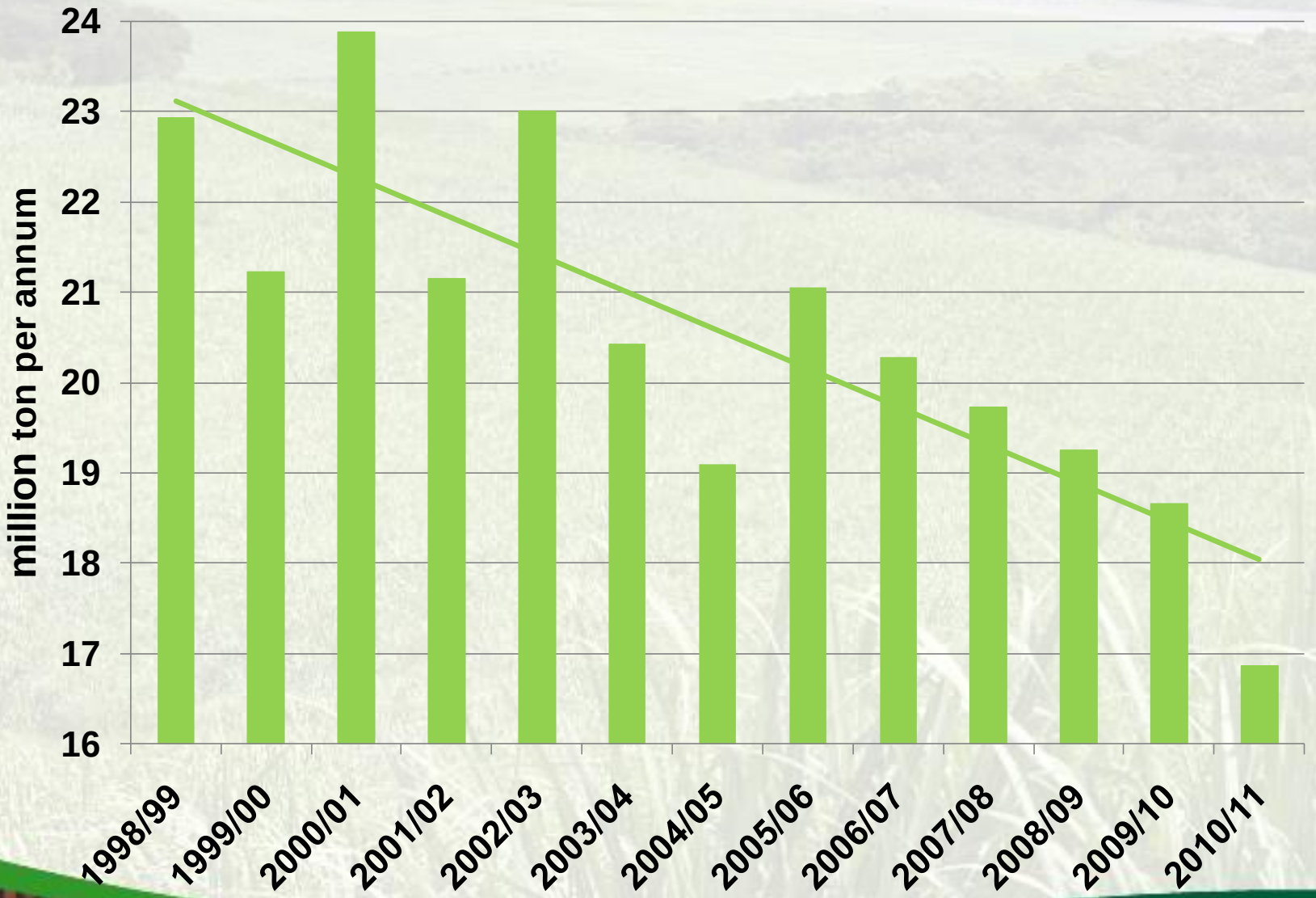
- Lowest cost quartile by international standards
- Declining industry – sugar only industry
- 3 mills sold at 1/10 of cost of new mills
- One greenfields investment last 25 years
- No investment in ethanol, electricity, new mills or refining

1/3 of farming irrigated cane

- IRP 2010 predicted electricity price increases render irrigated cane unviable on sugar alone
- Renewable Electricity critical for future viability

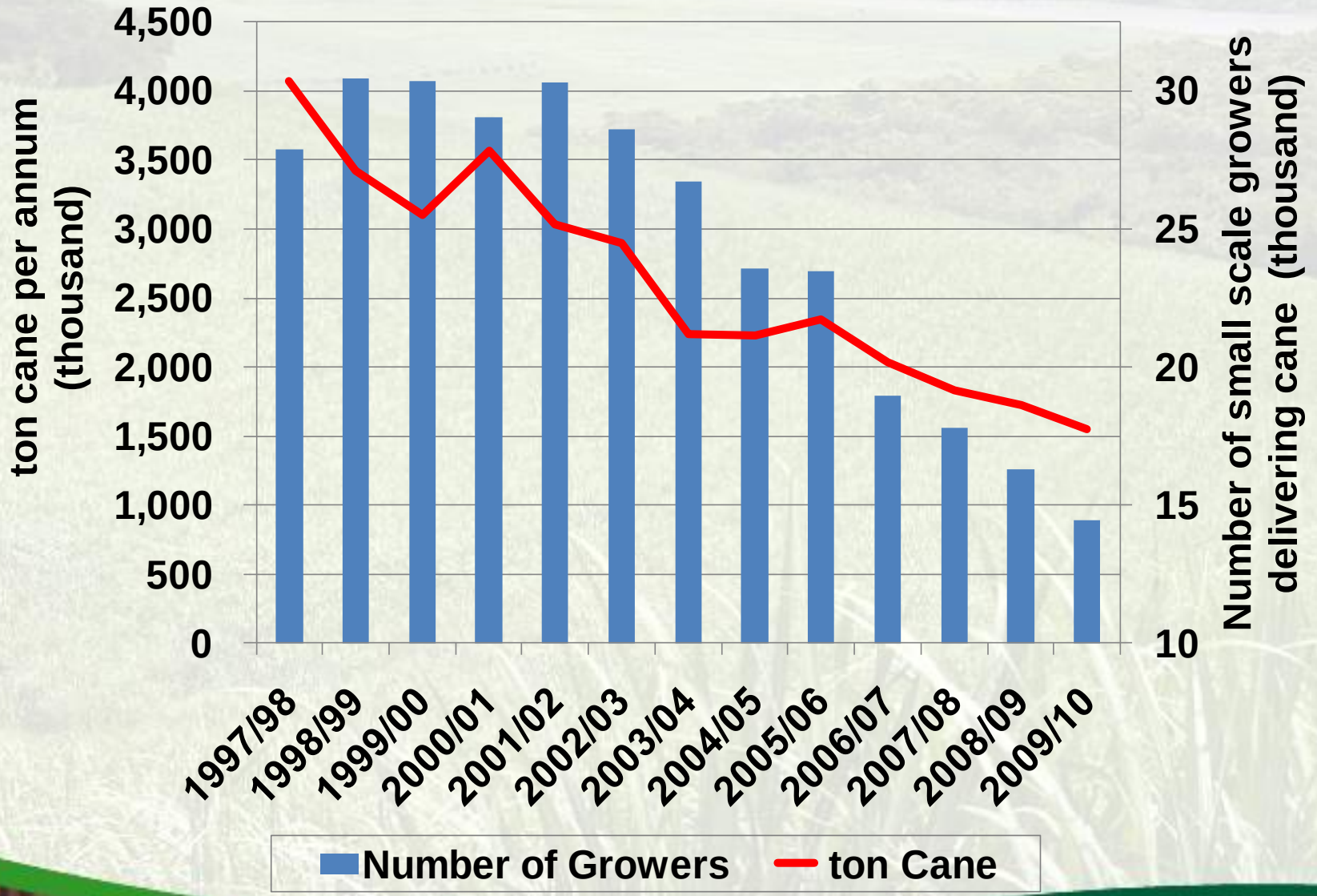
Sugar Cane Industry Trends

Annual South African Sugar Cane Production



Sugar Cane Industry Trends

South African Small Scale Growers



Sugar Cane Industry and IRP – Impact on South Africans

	Annual Production	2009/10 Season	Short-term under threat – secured through access to electricity markets (loss of sugar for export)	Additional farming to deliver cane for full mills and Electricity Generation
Cane Supply	Million ton	18,7	-7	+ 4
Area under Cane	hectare	391 483	- 147 000	+ 84 000
Sugar Mills		14	-6	
Sugar	Million ton	2,2	- 0,8	+ 0,5
Direct employment		77 000	- 28 000	+ 17 000
Indirect employment		350 000	- 127 000	+ 79 000
Economic dependants		> 1 000 000	- 370 000	+ 200 000

IRP 2010 – electricity from sugar cane fibre from 2013 secures and growths:

- 45 000 direct employment
- 206 000 indirect employment
- 570 000 economic dependants