


POTENTIAL FOR BIO-ETHANOL PRODUCTION IN RSA

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SAIAE CPD EVENT 210




CONTENTS

- Basic energy sources in the world
 - Liquid bio-fuels
 - Bio-ethanol feedstock and production routes
 - Potential from existing residue and waste
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INTRODUCTION

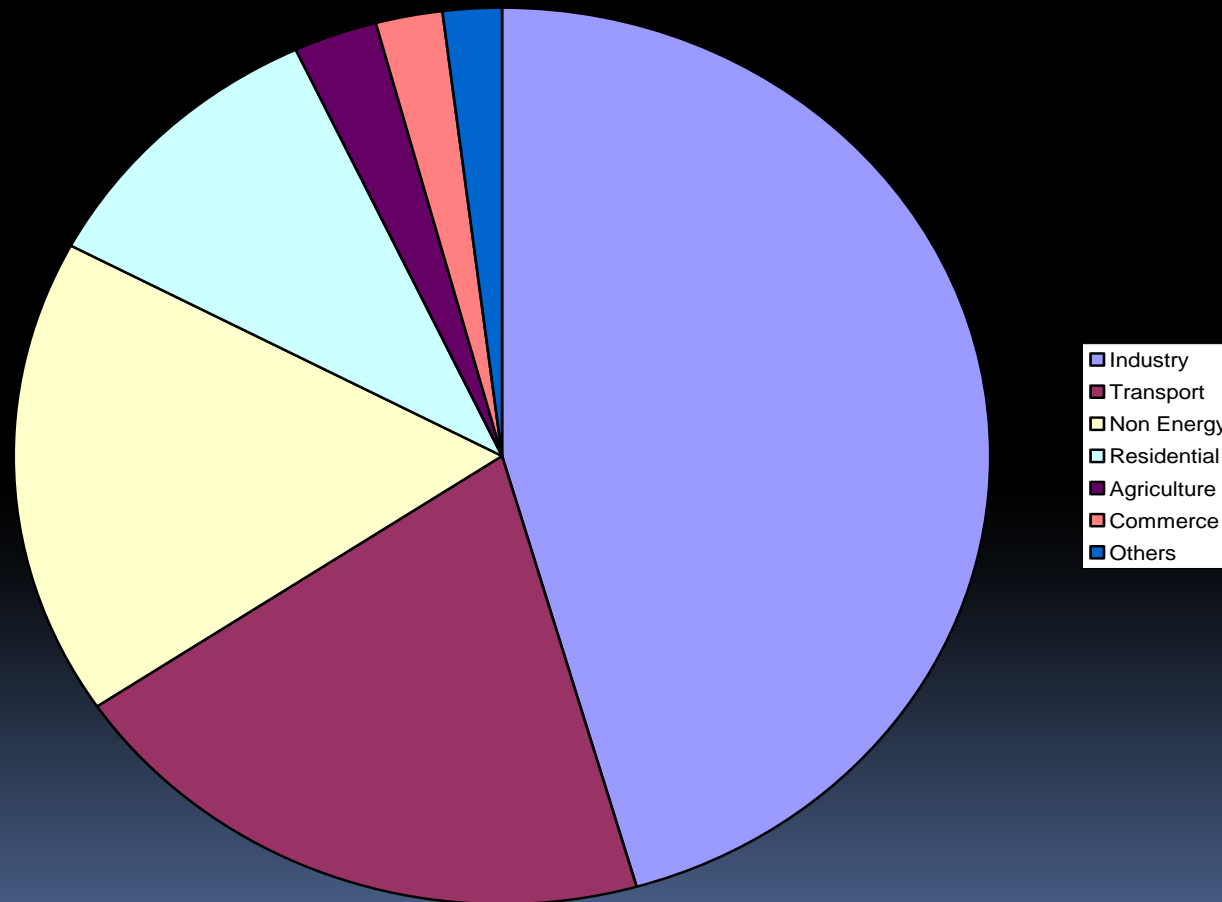
World Energy use

- The major source of energy in the world
- oil, gas and coal
- These fossil fuels contribute 80-90%
- value may vary from country to country based on the level of development
- Renewable energy only 13.6%

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- Most Governments want to reduced dependence on fossil fuel
 - 76 billion litres of Bioethanol
 - 17 billion litres of biodiesel

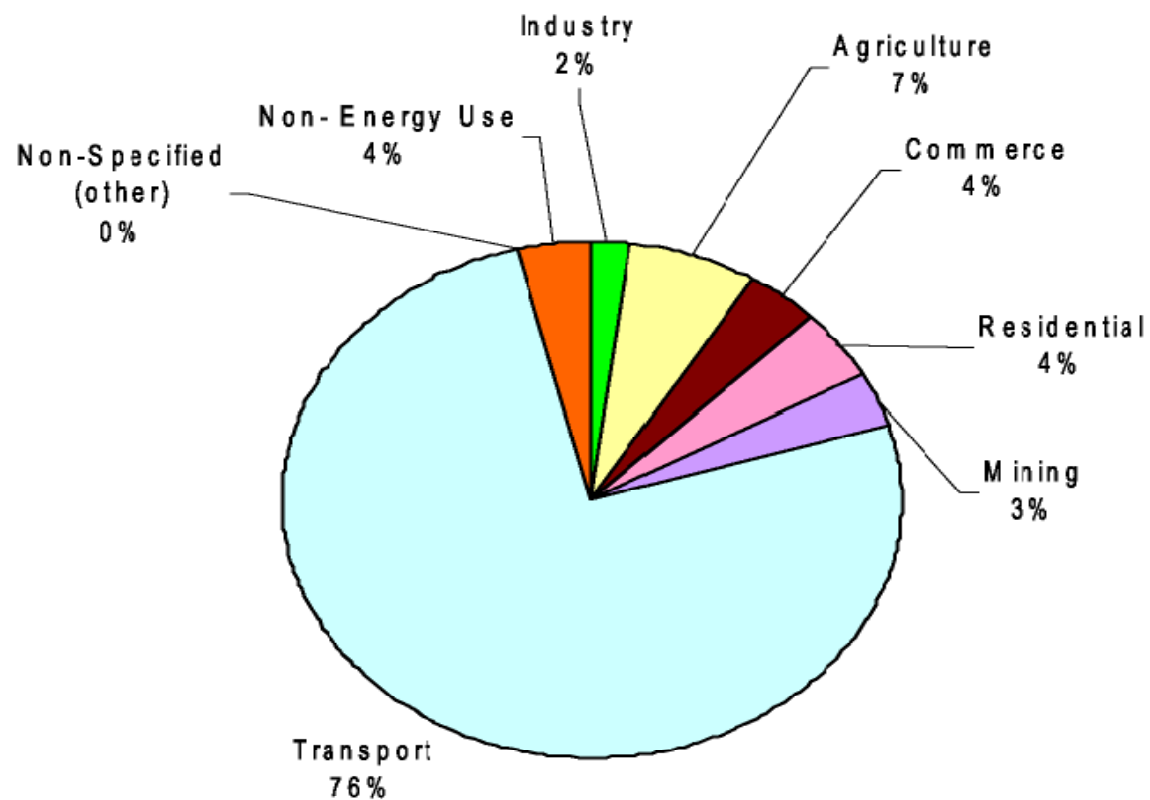
Energy Use in RSA

energy consumption in South Africa in 2000 Source: Based on SANEA (2003)



Uses liquid fuels

Sectoral Consumption Petroleum Products -2002

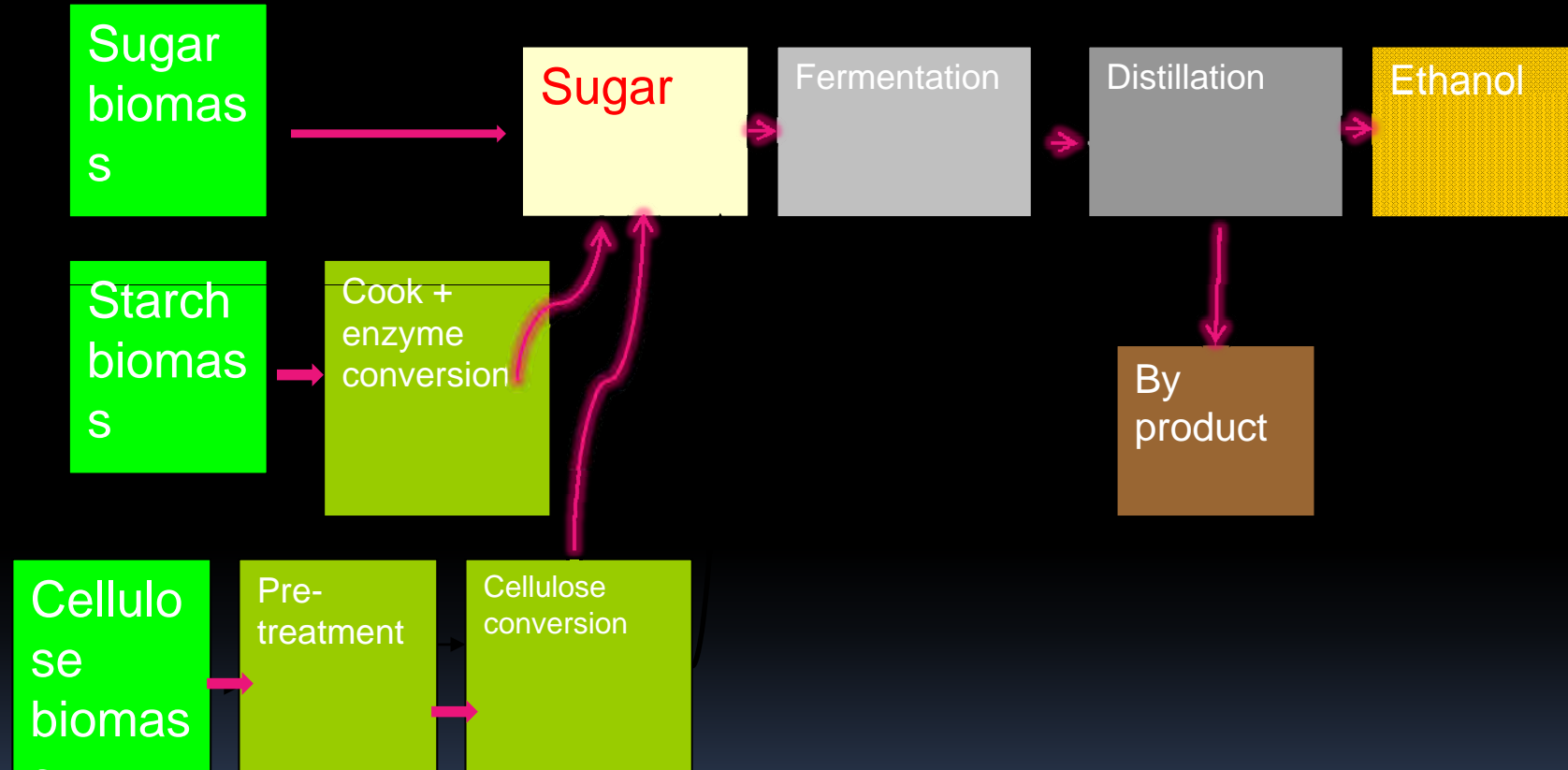


Which has the potential

- Bioethanol
- Biodiesel

There is a lot of feedstock for bioethanol production that is available but not being used

Bioethanol production routes



Should we use food to produce bio-ethanol?

- Rice has highest production and consumption in the world
- Yet the bio-ethanol produced $\frac{1}{10}$ years crop is only enough to satisfy **current** world demand for only 14 days
- However we have a lot of unused feedstock that do not disrupt food supply

BIOETHANOL YIELD COMPUTATIONS

- Total yield, $Q_s = A * Y * C_1 * C_2 * C_3$
- Where $A =$ Total planted area
- $Y = 1000 * \text{Grain yield in tons per hectare}$
- $C_1 =$ Ratio of straw dry matter to grain yield dry matter
- $C_2 =$ Yield of ethanol in litres per kg of dry matter

Potential yield from straw

Product	Area	Yield grain, mt per hac	Total alcohol yield	Yield per hac
corn	3,300,000	2.94	3,657,654,000	1108.38
wheat	750,000	2.06	582,465,000	776.62
sorghum	120,000	2.88	130,291,200	1085.76

Sugarcane byproducts

Product	Total sugarcane crushed, kg	Yield of byproduct per ton of sugarcane, kg	Yield of bioethanol litres per kg of feedstock	Total yield, litres	Yield per hac
molasses	18,178,000	40	0.28	142,515,520	488
Bagasse	18,178,000	210	0.30	1,145,214,000	3,925
Total				1,287,729,520	4,414

CONCLUSION

- Researcher have to continue working to reduce cost of production
- Government has to give more incentives to attract investors



Thank you

- The end
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