



**Energy Savings in Agriculture:  
EU Experiences to Support South Africa's Ambitions**

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# Context and Report Objectives

- Growth in the SA's agricultural sector is 2 to 4 more effective in increasing income amongst the poorest.
- The only sector with positive GDP growth in 2021 and 10% of export earnings
- However, sector faces ongoing challenges:
  - Energy security and rising electricity tariffs
  - Climate change (drought, heat waves, floods)
  - Products have a high carbon content (diesel & Eskom supply) – global net zero target
- Post-2015 NEES recognises agri as a fully independent sector – 30% by 2030
- Member states face similar challenges. EU Commission has developed policies, strategies and programmes, many of which could be appropriate for SA
- The report is framed from a climate change and energy saving perspective

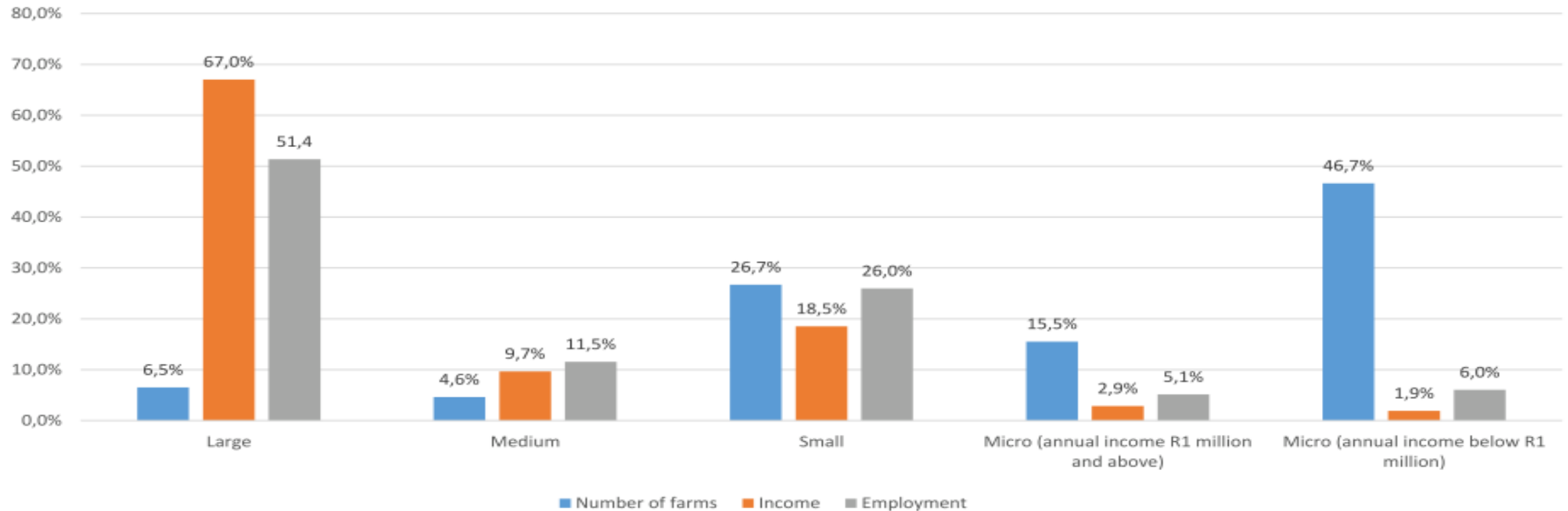
# Structure of the Report

1. Overview of the SA agri sector from an energy usage and decarbonization perspective
2. The EU policy implementation approach and experience - focusing on country appropriate energy interventions for the DMRE to consider
3. Report findings and recommendations

## Section 1:

# SA Sector Overview

- ~40k farms in 5 sectors (grain, animals, horticulture, mixed farming, agri services)
- 4 categories, where large =7% of total but 67% of income
- Broke \$10b export barrier & \$3.3b + trade balance (2017)
- Agri = 2.6% of GDP & with agro-processing rises to 12.6%
- Employment in labour-intensive low skill opportunities
- Functional & well organised sector (55 industry associations)

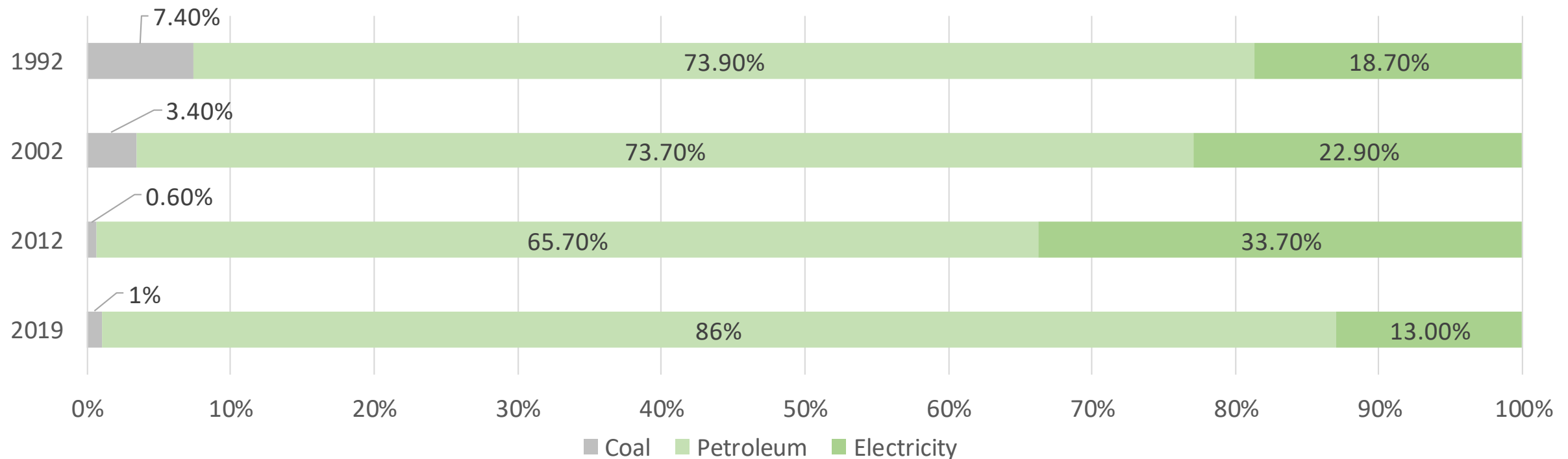


# Climate Change

- SA at the forefront of CC impacts
- Exports threatened by border carbon tax adjustments to address leakage
- TIPS (2020) Carbon intensity of SA exports >1 100 tCO<sub>2</sub>e / US1\$m vs global range of 100 and 500
- Large portion of exports to EU makes SA vulnerable to trade related climate risks
- Sector is adapting
  - Irrigation pump efficiency (biggest user of electricity) (SABI)
  - Drip irrigation
  - Energy Management Systems and RE supply
  - Carbon foot printing projects
  - Improved land use planning
  - Shade netting
  - Responsible farming practices

# Energy Consumption in the Agri Sector

- Sector consumes 3 to 3.5% of SA total energy
- 21% energy increase 2000 to 2015 - 38% production increase
- Cannot determine if this is due to efficiency improvements or a shift from energy intensive agri – but lags OECD average
- Need to improve energy input cost competitiveness is not new and several studies completed in this regard
- +ve coal eliminated. –ve decline in electricity limits EE & RE



## Section 2:

# EU Policy & Research Experience

- 1.3% of EU GDP with gross value add of EUR177b (2020)
- Energy usage is high 2% (2000) – 3.2% (2018) OECD average 1.7% and 2% respectively
- Energy diversification has commenced but will need to improve significantly if the 2030 and net zero targets are to be met
- Climate targets are challenged by increased mechanization
- Review member state NEEAPs found different approaches
  - France: very detailed 118 page plan, with 3 a pg agri section
  - Germany: shorter, agri included in commerce, trade & services
  - Sweden: Identifies broader interventions
- Cross-cutting nature of EE may be why interventions (DE, SE) are generic eg energy audits, MEPS, vehicle efficiency etc

# Energy consumption in the agricultural sector

- EU agri production relies heavily on fossil resources (56% from oil) & accounts for 10% of GHG emissions
- Discussion focuses on direct usage but 50% is indirect

	Crop Production	Animal Production
Direct energy input	Fuel, lubricant, oil, heating	Fuel, lubricant, electricity, gas heating
Indirect energy input	Machines, fertilizers, pesticides, seeds, machines	Machines, fodder import, fodder processing

- As one of the biggest land users, the sector has a large technical & economic potential for contributing meaningfully to the EU's legislated RE and EE targets
- Potential to produce bioenergy to replace liquid fuels
- Good progress has been made but not at the required scale and efforts will have to be intensified



# EU Agriculture Research on Energy Saving Measures (AGREEE - 2012)

- EU Research study – FI, DE, EL, NL PL, PT
- AGREEE identified energy saving measures in 13 subsectors of agricultural production, their importance, achievability, implementation cost & the payback period.
- 481 in total, where 2/3 were valued at < €25k
- The (this) study discarded measures NA/Low relevance to SA

The most common measures identified:

1. Application by soil fertility & availability of the compounds (24)
2. Reduced use of herbicides (18), fungicides (12) & pesticides (11)
3. Rational use of transportation (15)
4. Appropriate power of the tractor and other machinery (13)
5. Organic (11) & multi-compound (9) & reduced use of synthetic fertilizers (9)
6. Application of bioactive microorganisms / insects (10)
7. Better heat insulation (10)
8. High quality seeds (9)

## Recent Developments

- Value of AGREEE study lies in its large sample size and comprehensive approach. No follow up study
- A 2018 study tracked the changes in agri energy consumption across all 28 EU member states between 2005 and 2018
  1. The largest agri states (PL & FR) have the highest energy intensity.
  2. Strong link between the adoption of RE & economically developed countries (SE, AT, FI, DE, SK). Yet, FR IT and ES were very low.
  3. Total energy consumption shows a stable trend but masks that certain countries increased their energy consumption (RO, DE) while others declined (EL, PT, SE, PT) but could not say why.
  4. Concluded that RE has increased, but energy intensity decreased marginally. Intensity is set to increase as mechanization is pursued – providing an important opportunity for EE

# Conclusions and Findings

- SA's Agri sector exists on two levels – large & well resourced (7%) and the rest. Large farms recognise CC threat and are responding with world class solutions. The other 93% are vulnerable

*“government programmes should target farmers who cannot survive more than two loss making seasons (drought, floods, low market prices etc). They are the bedrock of the sector and are in desperate need of support.” Prof Midgley*

## Direct Energy:

1. Formalise the NEES and develop a NEEAP:
2. MEPS for electric motors and efficient lighting
3. Energy Audits
4. Awareness

## Indirect Energy:

1. Vigorously pursue green hydrogen – green ammonia.

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