Greenhouse Gas Emission from Agriculture in Saxony and its Reduction Potential (Results of the R&D Project)

Greenhouse Gas Emission

- Share of agriculture in total greenhouse gas emissions in Saxony in 2010: **5.2 %**, equivalent to 2, 717 kilotons of CO_2 respectively. (Framework: **National Emissions Reporting** , incl. land use /land use changes; Haenel et al., 2012); Fig. 1
- **Extended balance sheet**: selected upstream chains as well as credit for the use of farm fertilizer in biogas plants and direct energy use → **7.6 %**, equivalent to 4,011 kilotons of CO_2 respectively; Fig. 2
- Greatest influence: nitrous oxide from nitrogen inputs in soil and methane from digestion, especially in cattle; Fig. 3

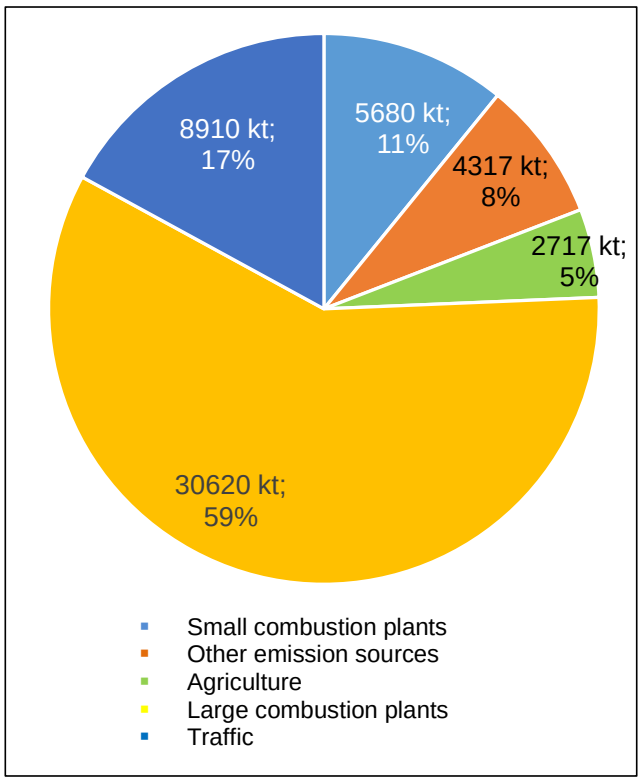

Fig. 1: Share of agriculture in total greenhouse gas emissions in Saxony in 2010

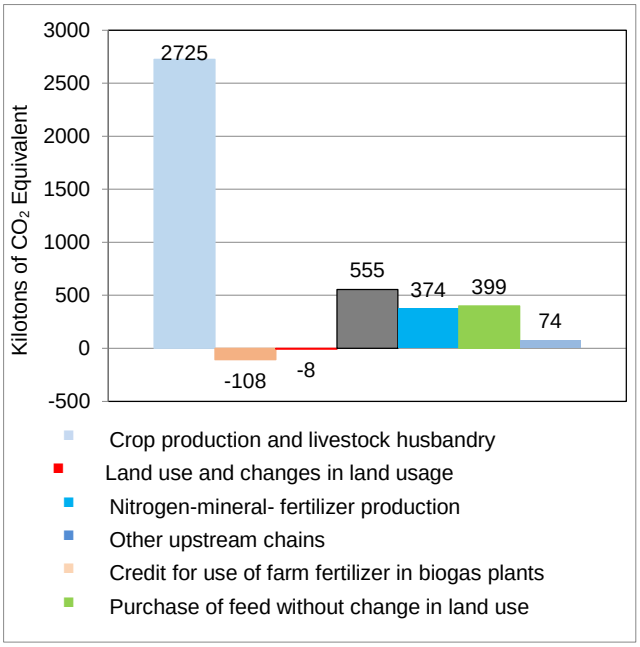

Fig. 2: Greenhouse gas emission 2010 (extended balance sheet)

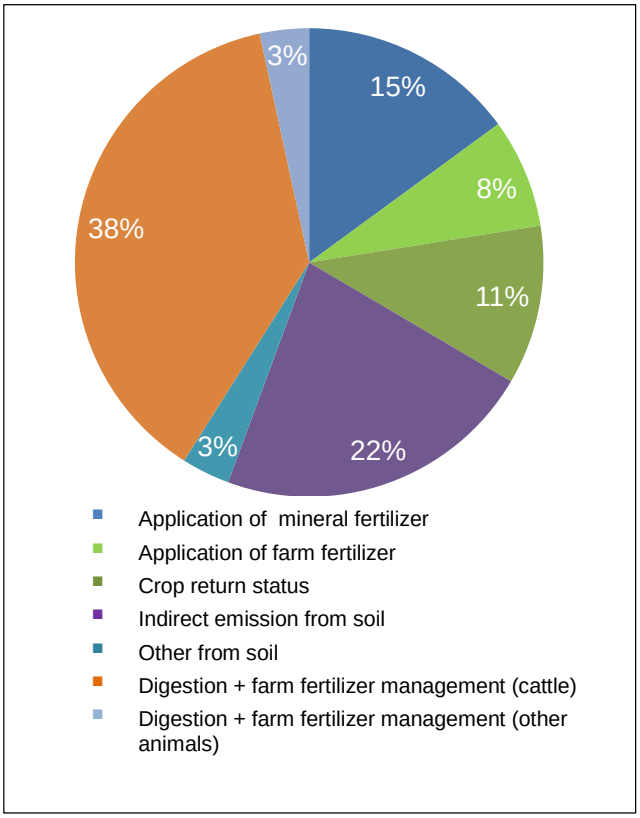

Fig. 3: Greenhouse gas emission from crop production and livestock husbandry 2010

Climate Protection Services Provided to Date

- Since approximately 2000 **to 2010 about 5%** (reference: extended balance sheet), respectively equivalent to 206 kilotons of CO_2 (Fig. 4)
- Mainly: preservation and establishment of grassland, nitrogen reduction under the Water Framework Directive, low-emission output of farm fertilizer
- Livestock husbandry (animal-related increase in efficiency while simultaneously reducing the number of animals, improved feeding of pigs and storage of farm fertilizer)
- Balance sheet overall: Further reduction of 520 kilotons of CO_2 equivalent per year through energy usage of biomass, and significantly, biogas technology

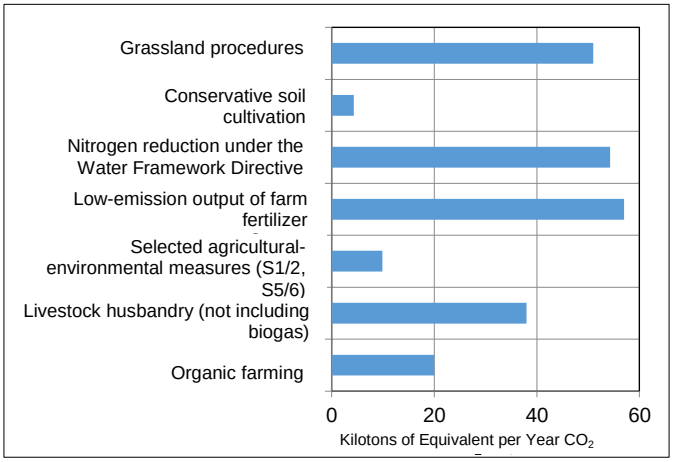

Fig. 4: provided climate protection services

Reduction Potential by 2020

- Extended balance sheet: **Potential: approximately another 5 %** (Fig. 5)
  Note: a simple summation of the reduction potential is not admissible (due in part to different variants and scenarios, also partially due to interference with procedures). Instead, the various potentials are contrasted with comparatives (theoretically possible from a realistic technical perspective respectively).
- Mainly: improvement in energy efficiency (conservation of diesel in tractors, reduction of power consumption, primarily for lighting and milk-cooling, reduction of heat consumption in greenhouse gardens, efficient heating technology, heating supply from renewable energy sources), preservation/ establishment of grassland and location-specific grassland measures (increase share of legumes in forage production, abstention from mineral fertilizers)
- Reduction potential by optimized nitrogen use is limited, but still available
- Balance sheet overall: energy use of biomass (primarily through optimization of biogas plants): Further reduction of around 250 kilotons of CO_2 equivalent per year

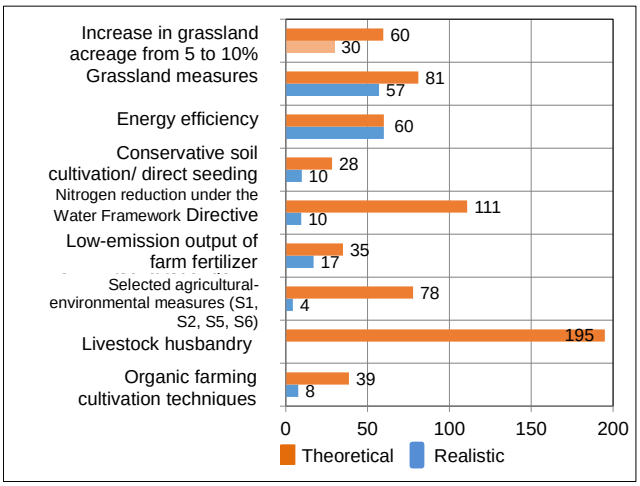

Fig. 5: Reduction Potential 2010 until approx. 2020 (reference: extended balance sheet)
*) *LfULG: The reduction potentials displayed as „realistic“ are bound to prerequisites which have yet to be established. At this point in time, the agriculture and economic conditions for grassland itself can hardly expect an increase of 5%. Therefor the LfULG maintains the position that it is most realistic to retain the present qualitative scale.*

Sources and Links

- Saxon Energy and Climate Program http://www.umwelt.sachsen.de/umwelt/klima/30157.htm
- LfULG series 31/2014; Sources for Fig. 1, 2, 4, 5 (Fig. 5 is modified);
- LfULG Emissions Report http://www.umwelt.sachsen.de/umwelt/luft/3609.htm
- Haenel, H., Rösemann, C., Dämmgen, U., Poddey, E., Freibauer, A., Döhler, H., Eurich-Menden, B., Wulf, S., Dieterle, M., Osterburg B. (2012): Assessment of gas and particle forming emissions from German agriculture 1990-2010, Report on Methods and Data (RMD), reporting 2012, http://literatur.ti.bund.de/digbib_extern/dn050109.pdf ; Data source for Fig. 3

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