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AGRICULTURAL ENERGY ADVICE IN AUSTRIA

COMPREHENSIVE ENERGY CONCEPTS & ENERGY COMMUNITIES

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DATA ABOUT STYRIA

- Population: 1.24 Mio.
- Area: 16 401.04 km²
- Forest-Area: 1.04 Mio. ha
- Share of Forest-Area: 61.4 %
- Agricultural Area 356 000 ha

Amounts of farms: 33,605 (2020)

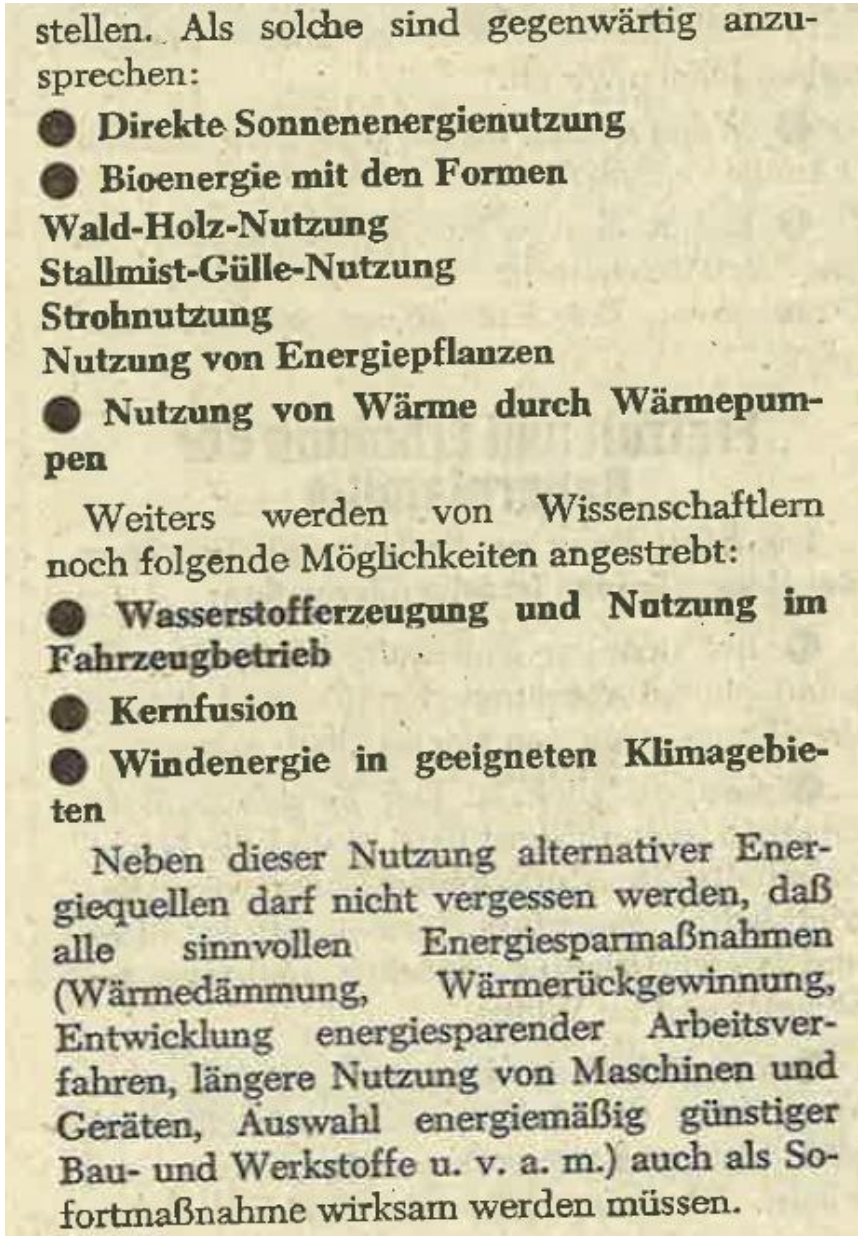
Thereof

- Full-time farms: 12,422
- Part-time farms: 21,183

- Organic farms: 4,233

ENERGY ADVICE SINCE 1978

- Chamber of Agriculture was a pioneer in Energy consulting
- energy is an opportunity also for additional income
- Become an energy farmer
- Still more or less same topics



stellen. Als solche sind gegenwärtig anzusprechen:

- **Direkte Sonnenenergienutzung**
- **Bioenergie mit den Formen**

Wald-Holz-Nutzung
Stallmist-Gülle-Nutzung
Strohnutzung
Nutzung von Energiepflanzen

- **Nutzung von Wärme durch Wärmepumpen**

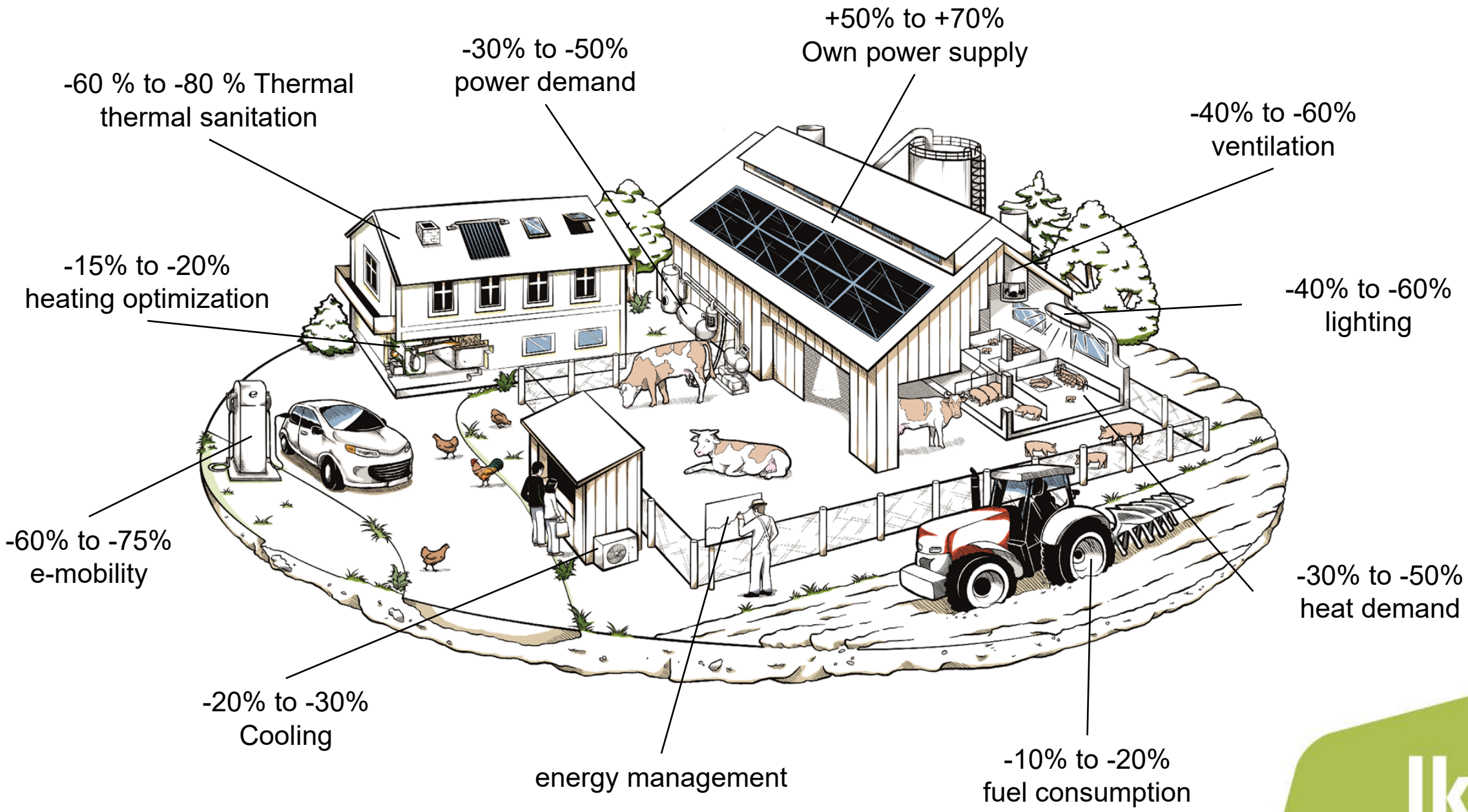
Weiters werden von Wissenschaftlern noch folgende Möglichkeiten angestrebt:

- **Wasserstofferzeugung und Nutzung im Fahrzeugbetrieb**
- **Kernfusion**
- **Windenergie in geeigneten Klimagebieten**

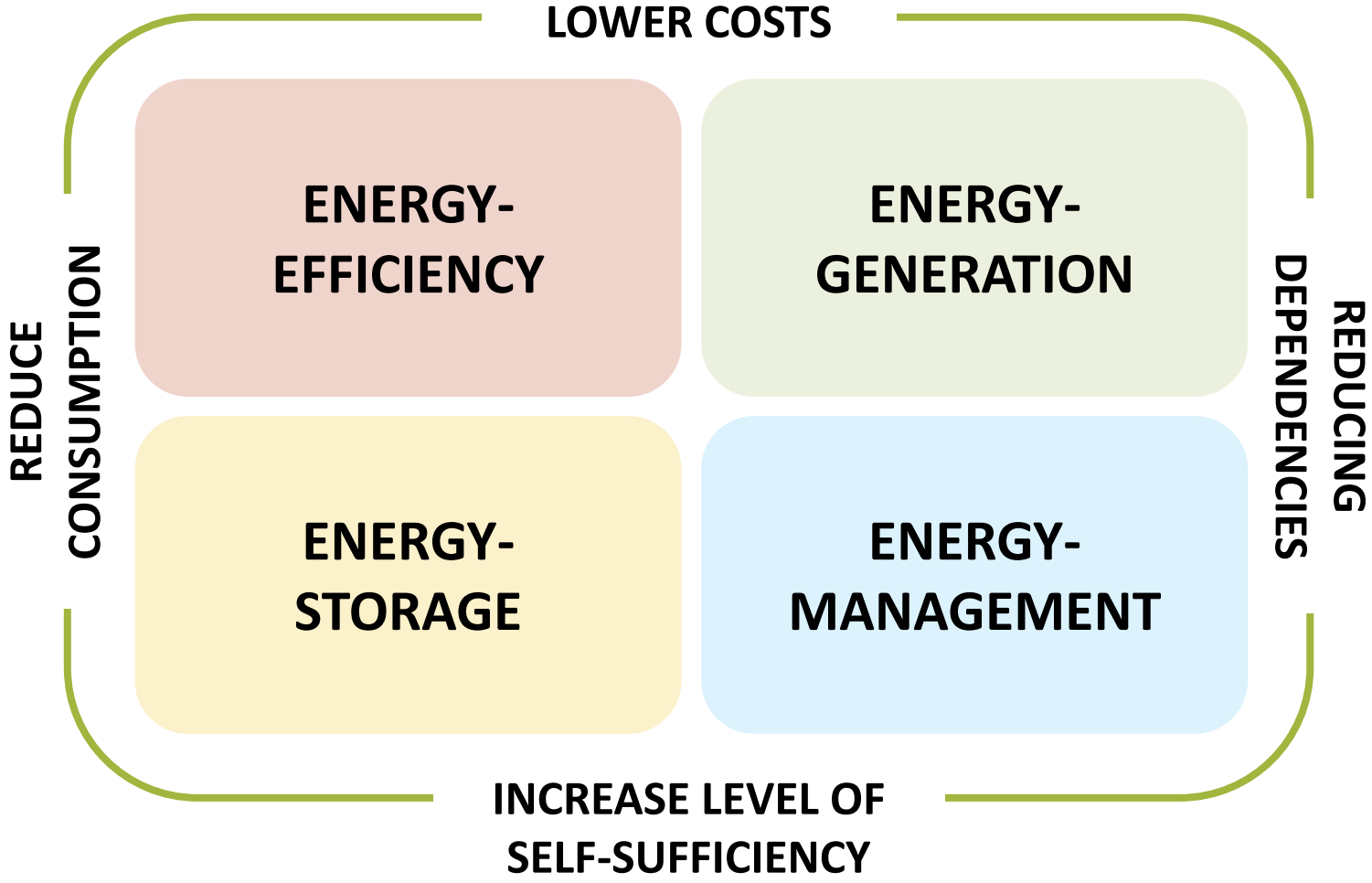
Neben dieser Nutzung alternativer Energiequellen darf nicht vergessen werden, daß alle sinnvollen Energiesparmaßnahmen (Wärmedämmung, Wärmerückgewinnung, Entwicklung energiesparender Arbeitsverfahren, längere Nutzung von Maschinen und Geräten, Auswahl energiemäßig günstiger Bau- und Werkstoffe u. v. a. m.) auch als Sofortmaßnahme wirksam werden müssen.

TODAY: ENERGY, CLIMATE AND BIORESOURCES DEPARTMENT

- Biomass
  - Ressources & logistics
  - Heating systems
  - District heating & CHP
  - Biogas
- PV & storage
- Energy efficiency
- E-mobility
- Energy communities
- Energy management


-60 % to -80 % Thermal
thermal sanitation
-30% to -50%
power demand
+50% to +70%
Own power supply
-40% to -60%
ventilation
-15% to -20%
heating optimization
-40% to -60%
lighting
-60% to -75%
e-mobility
-30% to -50%
heat demand
-20% to -30%
Cooling
energy management
-10% to -20%
fuel consumption

THE FOUR KEY POINTS OF ENERGY ADVISORY WORK



COMPREHENSIVE ENERGY CONCEPTS

- Knowing the demand
- What are the goals of the farmer?
- Knowing energy markets
- How to reduce costs?
- Generate additional income?

Table 1: **Example of recording electrical energy consumers.** A similar recording can also be made for the areas of fuel and fuel consumption.

Consumers	Quantity	Power according to type certificate (kW)	Duration of use (h/year)	Electricity consumption (kWh/year)	Costs (approx. 18 cents/kWh)
Ventilation fan	1	0,5	8.760	4.380	788 Euro
Vacuum pump	1	2,5	730	1.825	329 Euro
Milk pump	1	0,5	90	45	8 Euro
Cooling tank	1	2,5	1.460	3.650	657 Euro
Lighting	10	0,3	3.600	1.080	194 Euro
Hay ventilation	1	6	350	2.100	378 Euro
Total				**13.080**	**2.354 Euro**

- Comprehensive tailor made report with
  - Status Quo
  - Proposals for implementation
  - Calculated effects of implementation

MEASURES AT THE COMPANY

- Example: Dairy and forestry farm in Upper Styria (42 ha grassland, and 50 ha forest, approx. 40 dairy cows and calf breeding)

Area	consumption / year	Consumption inkWh	Own production	degree of self-sufficiency	costs / year
Electricity	27,000 kWh	27,000kWh	0 kWh	0%	8,100 €
heat	7000 l heating oil	70,000 kWh	0 kWh	0%	11,700 €
fuel	5,100 L Diesel 500 L of gasoline	54,230 kWh	0kWh	0%	8,960 €
In total		**151,230 kWh**	**0 kWh**	**0%**	**28,760 €**

- heating replacement + heating pumps replacement
- 30 kWp PV + 20 kWh storage

AFTER IMPLEMENTATION AT THE COMPANY

Area	consumption / year	Consumption in kWh	Own production	degree of self-sufficiency	costs / year
Electricity	25,900kWh	25,900kWh	14,800 kWh	57.1%	6,700 €
heat	72 SRM wood chips	54,000 kWh	54,000kWh	100%	5,400 €
fuel	5,100 LDiesel 400 L of gasoline	53,380 kWh	0kWh	0%	8,800 €
In total		**133,280 kWh**	**68,800 kWh**	**51.6%**	**20,900 €**
Comparison		**- 17,950 kWh**	**+68,800kWh**	**+ 51.6%**	**-7,860€**

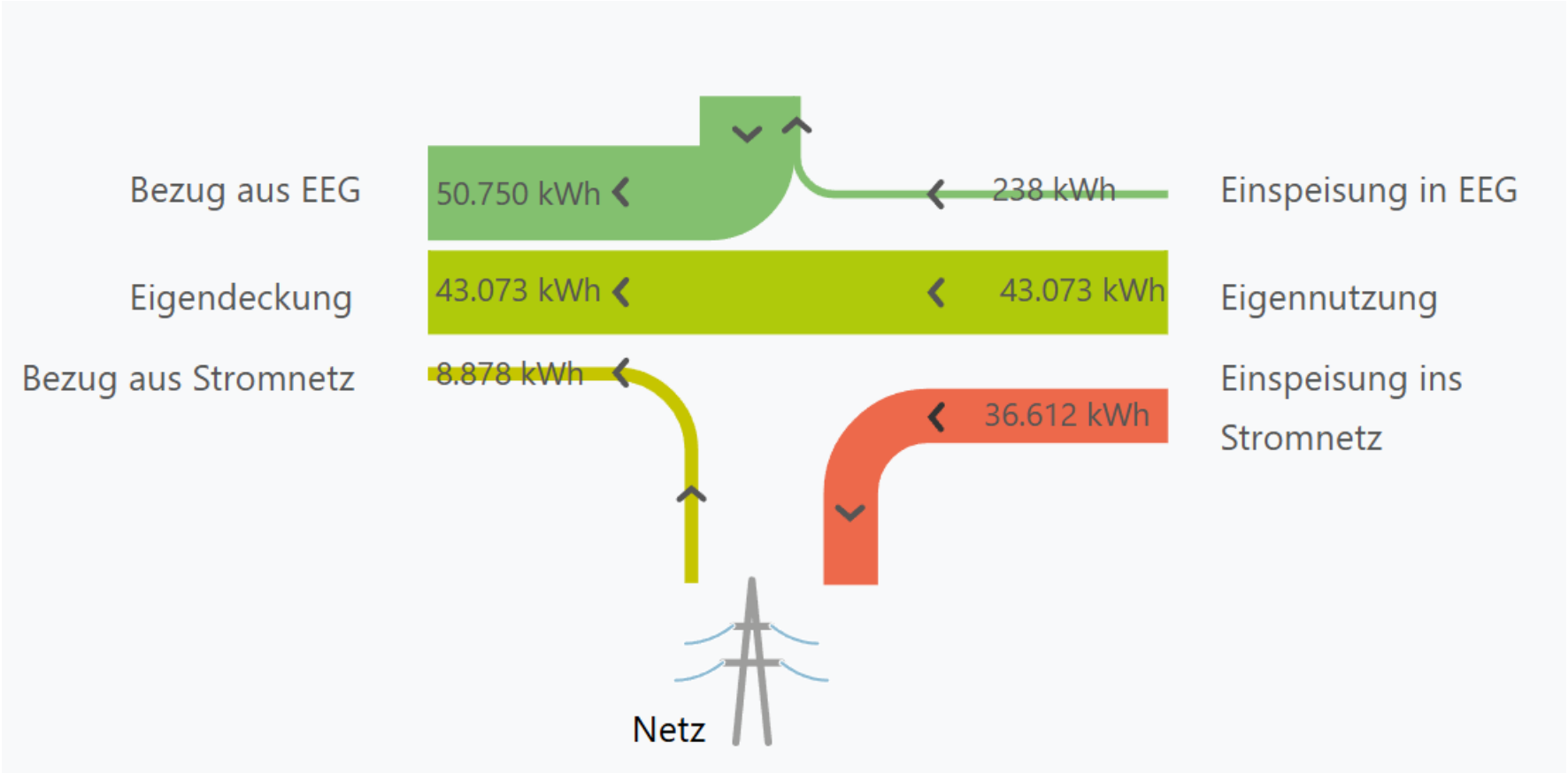
PROJECT: RENEWABLE ENERGY COMMUNITIES FOR FARMER COOPERATIVES

- Development of a sustainable energy community that integrates electricity production with an existing biomass-based district heating network operated by farmers

1. Self-sufficiency – electricity from your own source (PV + Battery)
2. direct power line (Between DHS and water power plant)
3. Energy community
4. Power 2 Heat
5. Public Grid

MAIN ACTIVITIES THAT THE CODIE HAS CARRIED OUT:

- Nearly 50 % of DHS electricity could be covered by creation of local REC



ENERGY-EFFICIENT AGRICULTURE– INFORMATION

https://www.lko.at/publikationen+2400++2548420?filter=140

Mit Unterstützung von Bund und Europäischer Union
Bundesministerium
Land- und Forstwirtschaft,
Regionen und Wasserwirtschaft
LE 14-20
Europäischer Landwirtschaftsfonds für die Entwicklung des ländlichen Raums: Hier investiert Europa in die ländlichen Gebiete.
Ländliches Fortbildungs Institut LFI

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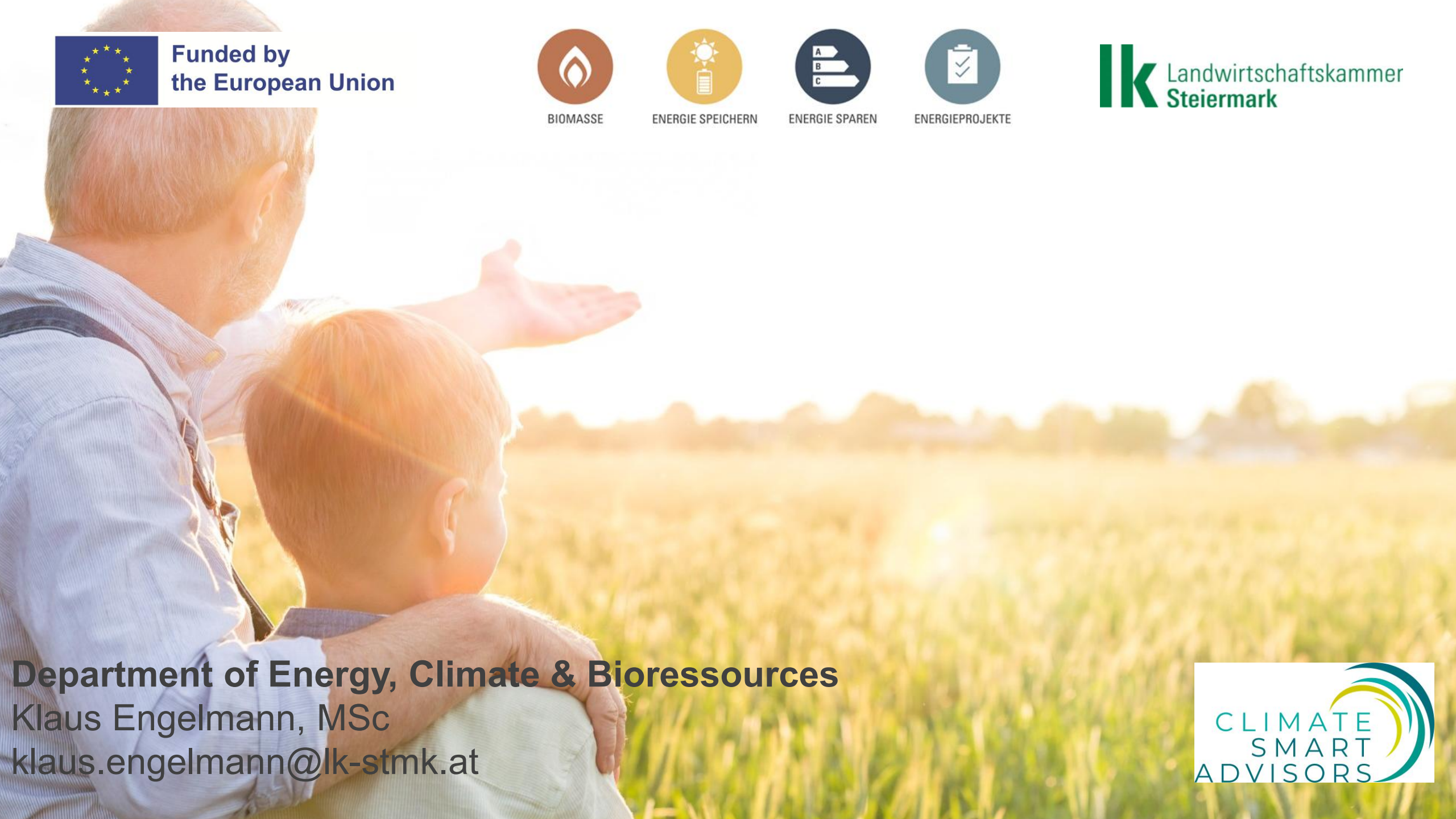
BIOMASSE ENERGIE SPEICHERN ENERGIE SPAREN ENERGIEPROJEKTE

Landwirtschaftskammer Steiermark



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