

AUSTRIA

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1 OVERVIEW OF THE REGION

Characteristics of the Region

Styria is a federal province or Bundesland, located in the southeast of Austria. It is the second largest of the nine Austrian federal provinces, covering 16,401 km². The population, as of 2011, was 1,210,700.

The capital is Graz with 265,000 inhabitants¹.

Styria is subdivided into 13 counties and 542 communities.



Figure 1 - Location of Styria within Austria

Governance: The so-called Landtag is the elected legislative authority of the Bundesland. Its legislative power covers sectors that are not explicitly a national competence. Energy policies are in large part in national legislative competence; the Landtag executes them.

Styrian industry is characterised by heavy industry, mining, automobile production and other production sectors. As more than 50% of Styria is covered by forests, wood processing, pulp and paper industries are important.

The GDP per capita was 29.600 (2011).

The employment rate was 93.6% (2011)

Data: Wirtschaftskammer Österreich (Ed.) (2013).

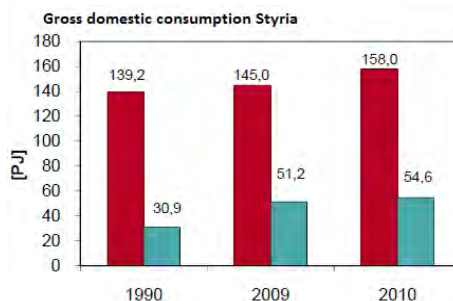
Energy demand and supply of the Region

In Styria, the gross energy demand increased by 25% between 1990 – 2011, the use of renewable energy sources increased by 77% in the same period (Umweltbundesamt, ed. 2012)

	Austria 2007	Austria 2011	Styria 2007	Styria 2011	Change 2007 – 2011
Domestic ²	402.3	418.3	55.9	*	+4%
Transport	382	358.8	2.3	*	-6%
Industry	313.2	312	64.5	*	<-1%

	Austria	Styria
Domestic production	489	n.s.
Import	1.288	n.s.
Export	296	n.s.
Gross domestic consumption	1458	213
Energetic final consumption	1089	169

Table 1 – Energy demand and supply of Austria/ Styria in PJ in 2011
Statistik Austria (2013a)



Red (left): fossile Blue (right) renewable

Figure 2 – Energy gross domestic consumption Styria 1990 – 2010
(Umweltbundesamt, ed. 2012)

In Styria, the share of industry in final energy consumption is > 40%. The share of transport is increasing at 25%, private households are responsible for 25% (Kettner C. et al., 2012).

Total energy consumption

No data is available for Styria in 2011 for total energy consumption, however, the development in Styria may be compared to the Austrian trend for 2011. The increase in the “domestic” sector may be attributed to a considerable increase in the public and private services sub sector and a weaker increase in the private households sub sector.

	Austria 2007	Austria 2011	Share of TEC 2011 %	Styria 2007	Styria 2011	Share of TEC 2011 %
Coal	24	18	1.7	6.0	5.0	3.0
Oil	458	416	38.2	57.0	51.0	30.4
Gas	186	185	17.0	34.0	36.0	21.4
Renew.	139	158	14.5	27.0	29.0	17.3
Electricity	221	218	20.0	36.0	36.0	21.4
District Heating	56	73	6.7	7.0	10.0	6.0
Combust. Waste	12	20	1.8	1.0	1.0	0.6

Table 2 – Total energy consumption (TEC) by fuel in Austria/Styria in PJ

Share of energy sources for electricity production (%)

In 2010, Austria produced 61.846 GWh. Austria exported 17.363 GWh, but also imported 19.855 GWh to cover the domestic need (consumption + losses). 66% of energy production for electricity is generated from renewable sources. Austria mainly exports electricity generated from hydropower and imports electricity generated by thermal power stations. Styria consumes about 8.500 GWh/yr. and produces about 4.725 GWh/yr.³

Compared to 1990, Styria produces +55% (Austria: +38%). Over the last years, the percentage of fossils (esp. coal) decreased remarkably. The total share of renewables is about 57%. About 43% are produced from fossil resources including electricity self-supply by industry (Umweltbundesamt ed., 2012).

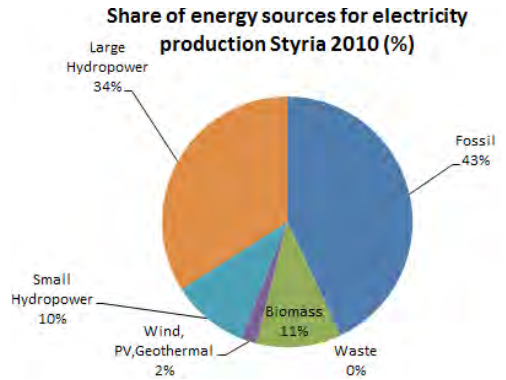


Figure 2 – Energy sources for electricity production Austria (top) and Styria 2010 (Transformation output data) (Umweltbundesamt ed., 2012).

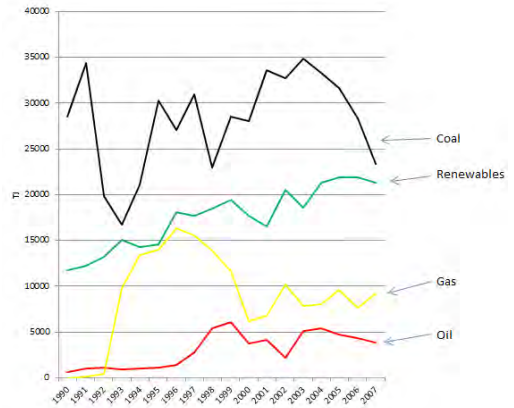


Figure 3 – Development of primary energy resources for electricity and District Heating in Styria (Transformation input data) (Umweltbundesamt ed., 2012).

GHG emission factor for electricity from grid (kg CO₂ eq/kWh)

In 2010, all Austrian GHG emissions amounted to 84.6 Mio. Tons CO₂ eq. 18% of GHG total are attributed to the energy production sector (industry accounted for 31%, traffic for 27%) (Umweltbundesamt ed., 2012).

As demonstrated in Chapter “Share of energy sources for electricity production”, Austria is an exporter but also an importer of electricity (mainly from fossil resources and nuclear power).

This is also reflected in the GHG emission factor for electricity.

Taking the “Austrian Power Mix”⁷⁴ for electricity as a basis (considering also imported electricity), the GHG emission factor for electricity from grid was calculated as being 181g CO₂eq/kWh in 2010 (Umweltbundesamt ed., 2012). There are no Styria specific data available.

2. CURRENT SITUATION: TARGETS RELATED TO ENERGY POLICY

Total GHG current emissions (ktCO₂eq, all sectors combined)

In 2010, Austria emitted 84.6 Mio.tons CO₂eq and therefore exceeded the Kyoto target by 15.8 Mio.tons.

14% of Austria’s population live in Styria. In 2010, Styria caused 13 Mio.tons CO₂eq, i.e. 15% of Austria’s total GHG emissions. This corresponds to 10.7 tons CO₂eq/person/year. Styria’s GHG emissions slightly decreased by 3,3% from 1990 – 2010. 2010’s CO₂ emissions are at the same level as in 1990 and correspond to 84% of GHG emissions. Industry is responsible for 42% of GHG emissions in Styria; transport for 20%; 13% from energy supply; 12% from small consumers (mainly buildings) and 10% from agriculture (Umweltbundesamt ed., 2012).

GHG reduction targets (% and years)
EU overall target is a 20% GHG reduction related to 1990, and a share of 20% renewables for energy consumption until 2020 (EU “20 – 20 – 20” target).

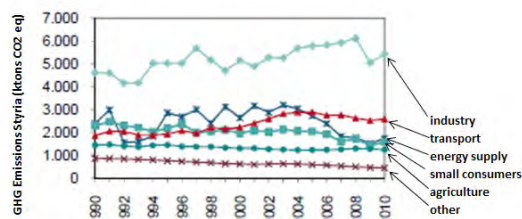


Figure 4 – GHG emissions by sectors in Styria (Umweltbundesamt ed., 2012).

For all parts of economy that are subject to the EU-ETS (mainly production and energy supply), no national or regional Bundesland-targets

have been formulated. EU-ETS targets apply. The national GHG emission target for the Non-ETS sectors (effort sharing decision) is a reduction by 16% related to 2005 emissions to be reached until 2020. This target has not been broken down to the provinces (*Bundesländer*) so far.

Regional targets related to renewable energy

Austria has to raise the share of renewables for gross energy consumption to 34% by 2020. In 2008, this share was calculated as being 28.8% (Umweltbundesamt ed., 2012). Several provinces have defined regional targets based on this national target.

- In 2010, the federal government of Styria in a common process with more than 100 stakeholders, formulated a “Climate protection plan”. By this plan, Styria adopts the Austrian national energy targets for non-ETS sectors and goes beyond. Targets are defined as follows:
 - GHG reduction 16% related to 2005 emissions to be reached until 2020;
 - renewables: share oriented at the Styrian GDP in relation to the Austrian GDP (2010: 12,5%) (Umweltbundesamt ed., 2012); This corresponds to 7,5 PJ (Umweltbundesamt ed., 2012).
 - until 2030, GHG reduction of at least 28% compared to 1990 (see EU 50-50 target) ”basic scenario”.

Formulation of an “innovation scenario” corresponding to EU ambitious reduction targets 30% until 2020 and 80% until 2050.

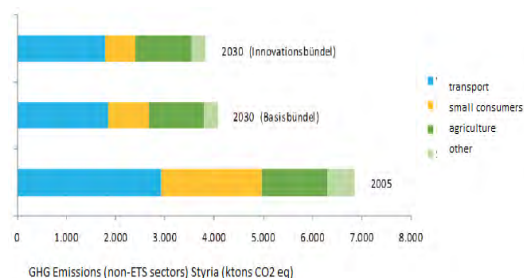


Figure 5 – Styrian targets for GHG reduction by non-ETS sectors (bottom: 2005; middle: basic scenario; top: innovation scenario) (Umweltbundesamt ed., 2012).

“Small consumers” essentially correspond to the building sector

Achievement of regional targets

To achieve these targets, the Climate Protection Plan formulates 26 packages of measures to be taken in the sectors buildings; mobility; agriculture and waste management; production; energy supply and lifestyle. Measures concentrate on sectors that can be significantly shaped at *Bundesland* level.

The sectors mobility and buildings are presented hereafter.

The Styrian overall targets for buildings are:

- increase the refurbishment rate;
- increase energy efficiency in private households;
- raise the standards for new buildings.

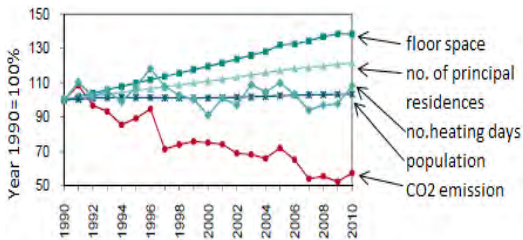


Figure 6 – Trends in private housing Styria (Umweltbundesamt ed., 2012).

The sector buildings has the biggest potential for GHG reduction in Styria as shown in Figure 5. This situation is due to the fact that the refurbishment rate of buildings (especially those that had been constructed before the mid 80s) is still very low. The basic target is to reach a thermal heating standard by refurbishment of 70 kWh/m²/yr.; innovation target is 50 kWh/m²/yr. For the smaller proportion of new buildings, the EPBD applies. As for them, beyond 2020, no GHG emissions are expected (100% renewables for heating – the majority of buildings will have zero-emission standards with mainly solar heating/biomass providing the remaining need for heating).

Beyond refurbishment, considerable effects are expected by fostering the switch to renewable energy sources for heat; mainly solar energy and bioenergy; and increasing their efficiency (Umweltbundesamt ed., 2012).

Relevant legislation and directives enacted at national level are the implementation of the building directive in Austria, obligatory energy passes for all buildings on the residential market and insulation prescriptions.

A huge number of incentives have been set to reach GHG reduction targets. Focussing on buildings, mobility and energy supply, some are at Styrian level, the most important in number and volume are at National level. There are financial incentives (grants, credits, innovation and research funding) for different target groups, but also consulting services offered as presented in Figure 7.

Achievements

Refurbishment rates increased considerably over the last years in Styria. The number of all-embracing energetic refurbishments attaining a maximum of GHG emission reduction for a building is still weak as illustrated in Figure 8.

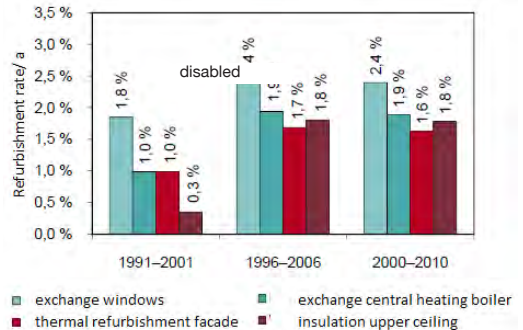


Figure 8 – Refurbishment rates in Styria (Umweltbundesamt ed., 2012).

The total energy consumption of households increased by 9% between 1990 – 2010. The share of fossil energy sources for heating is decreasing (except gas), the share of renewables (esp. biomass) is increasing. Solar energy for thermal heat is booming: between 2004 – 2010, the additional power increased by +144% (Umweltbundesamt ed., 2012).

A problematic issue is the steadily raising need for electricity. Better energy efficiency is compensated by raising electrical consumption. Despite opportunities, there are still important subjective barriers in the buildings sector that

Funding/Incentives by Styria /Styrian communities

	P	C	E
Photovoltaics (residential buildings or public social services)			
Solar heating systems (residential buildings or public social services)			
Switch to district heating			
Modern wood heatings			
Refurbishment of residential buildings			
Switch to automatic wood heating systems and heat pumps			
Electric small vehicles (handicapped persons)			
Bicycles for Transport, parking facilities			
Electric, hybrid or gas vehicles for taxi enterprises			

National funding and incentives

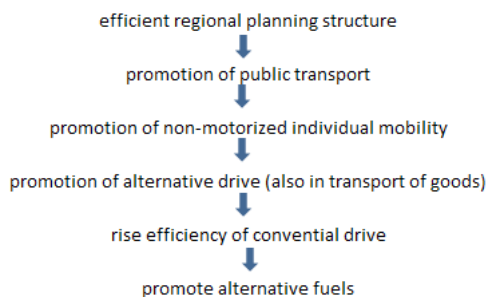
Heat pumps			
CO2 reduction for in-company mobility			
Overall thermal refurbishment			
Electricity generation from renewables for isolated locations			
Large scale solar heating plants			
Energy from biomass/Biogas in Agriculture			
Energy efficiency cheque for SME			
District heating connection for enterprises			
Low energy new constructions			
Eco innovation jobs			
Local heat supply with renewables			
Exemplary refurbishment			
Research Programmes Energy and Environment			
LED systems in enterprises			
CHP from natural gas			
Research programme E*mission			
Energetic use of biogenic resources			
Production biogenic combustibles/ fuels			
Climate protection measures in communities			
Micro-public transport in communities			
Mobility management for tourism, bicycles, regions			
Energy saving in enterprises			
Wood heating for self-sufficiency in enterprises			
E-mobility for climate- and energy regions			
Energy efficiency cheque for agriculture and forestry			
Wood heating systems for privates			
Investment grant for energy generation from renewables			
Research on consequences of climate change			
Research Grants for demo projects			
Photovoltaics			
Refurbishment cheque for private households			
Tariff support within the law on electricity from renewables			
Vehicles with alternative drive			
Climate and energy model regions			
Programme climate:active Mobility management			
Programme climate:active Electro bicycles			
Programme climate:active air conditioning and cooling based on renewables			

hamper the success of measures: Individual access to information on individual energy saving potential and potential for renewables is lacking or difficult. Despite financial incentives, investment costs remain high. Energy prices, e.g. for fire wood/ pellets, gas, are quite unstable. And finally, attitudes still remain indifferent and there is not much readiness shown to investment in appropriate measures.

Besides buildings, mobility is the second important sector for GHG saving measures in Styria. Traffic is accountable for 20% of GHG emissions. It has been calculated that up to 1.3 million tonnes CO₂ could be saved until 2030 (*Umweltbundesamt ed., 2012*).

The main cause of traffic emission problems is the dispersed settlement structure in Styria. 33% of car journeys cover distances of up to 2 km only (*Umweltbundesamt ed., 2012*). Therefore, in the long term, the shift to an energy efficient regional planning structure is of highest priority.

In order to reduce GHG emissions and increase energy efficiency, priority is given to the following bundles of measures in this order (*Umweltbundesamt ed., 2012*).



Some of the potential measures to reduce GHG are within the competence of the provincial government, but a considerable part is under the control of the national government. Styria has defined quite general targets:

- increase the share of emission free/low emission means of person and goods transport;
- increase the use of efficient and alternative drive systems.

Figure 7 – Financial incentives provided at Styrian and national level for target groups P (Privates), C (Communities) and E (Enterprises) (*Austrian Energy Agency 2013*)

All priorities mentioned above – except the regional planning long-term goal – are considered in the existing incentives scheme. The vast majority of financial and non-financial incentives is set under national responsibility (see also *Figure. 7*).

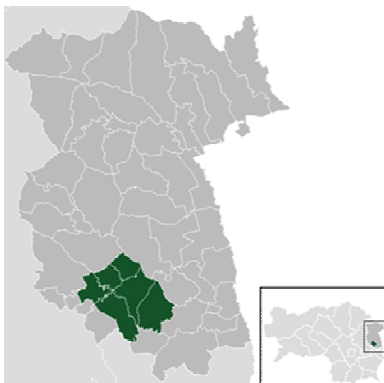
The majority of regional Styrian budget in the traffic sector strives to foster public transport systems especially in the commuter belt of the provincial capital. The discussion on efficient regional planning is underway.

Summary

- Despite achievements (especially efficiency in industry; shift to renewables), the situation of GHG emission in Styria requires effort especially in the traffic and buildings sector. These sectors are mainly driven by individual consumption patterns.
- Energy and GHG related legislation framework is mainly set at the national level.
- There are numerous financial incentives provided for measures at private, enterprise and community level.
- The most important incentives are provided at the national, not regional level.
- The Bundesland and region of Styria has mainly the duty to support and execute EU and national targets and legislation frameworks. Its individual constitutive power is limited.

3. CASE STUDY: ÖKOREGION KAINDORF

The Okoregion Kaindorf case study was selected to demonstrate how, in a bottom-up process, a group of communities in Eastern Styria decided in 2007 to develop towards an “eco-region”



Area, Population, Promoters

The eco-region is formed by a voluntary association of 6 communities (Dietersdorf, Ebersdorf, Hartl, Hofkirchen, Kaindorf and Tiefenbach) in Eastern Styria (see map above). The region has a population total of 5.600 inhabitants and covers an area of 70 km². It is characterised by the dominance of agriculture, supplemented by small-scale manufacturing such as food wood processing and handicraft enterprises with the absence of any bigger industries or towns. The settlement pattern is best described by scattered villages with single family homes prevailing. The region is situated about 10 km from Hartberg, a major centre providing all kinds of infrastructure. A considerable number of inhabitants are commuters to this major centre, inside the region itself and to the Styrian capital 40 km away Statistik Austria (2013b). The traffic infrastructure in terms of public transport is very poor, individual motorised mobility dominates.

It was not Styrian regulation, financial incentives or political framework that fostered or enabled the “eco-region” plan. The main driver of this initiative has been communities with strong interrelation ties and a few visionary people. Their basic motivation is to combat climate change by regional consciousness, responsibility and collective as well as individual action.

Objectives and methods⁵

The goal “Eco-region” goes beyond of what we understand as “Smart energy region”.

The Eco-region Kaindorf is aiming at:

- fostering an eco-friendly circular flow economic model: Sustainability and economic viability do not exclude each other;
- attaining renewable energy self-sufficiency;

- seeking CO₂ neutrality at regional level;
- giving an example to other regions.

The formal target set by the eco-region is a reduction of regional CO₂ emissions by 50% (2011) and by 80% (2015) compared to 2006 data. CO₂ neutrality should be reached by 2020.

Methodology and structure

The Associations defined 8 thematic areas for action: Awareness building; Mobility; Buildings; Heating and electricity; Agriculture and Humus build-up; Energy saving; Regional gastronomy; Financing.

For each of these areas, a working group has been set up and a working programme formulated. The working groups are composed by interested and competent citizens.

The group elaborates on solutions and single projects, involving other groups or individuals if required. The association's Steering Committee is composed of all mayors, leaders of all working groups and other representatives of population and business. Membership is open to all individual or juristic persons (membership fees start by 10 €/yr.).

The Steering Committee serves as a coordination point for all activities, a link to the population, enterprises and communities, and decides on the use of funds. The initiative is proud not to be dependent on any external funding, although external funding incentives are being used.

Objectives of some thematic areas in short:

Awareness building

- Events to inform on climate change, raise responsibility and show ways to act
- Promote responsible, eco-friendly and regional consumption

Mobility

- Making non-motorised mobility more attractive
- Promoting e-mobility
- Promoting renewables-based fuel
- Regional mobility concept

Buildings

- Reduce CO₂ emissions by energy-saving improvements of (mainly existing) buildings

Heat and electricity

- Switch of entire region to CO₂ neutral heating systems (private households, enterprises)
- Switch of entire region to electricity supply by renewables

Energy saving/Water

- Communicate and enhance possibilities to save energy in heating, electricity and water

Agriculture and humus build-up

- Promotion of humus building in agricultural soils:⁶ Raising humus contents in soils from about 3% at present to 6% in steps of 0,1%/yr.
- Promotion of agroforestry and short rotation systems in the region

Long term focus

The concept of the 'Eco-region' is the development of a process towards defined medium-term goals such as emission reduction targets and CO₂ neutrality. Besides these quantifiable objectives, the region – walking the process path – aims at exploring a more general and complex challenge: an eco-friendly circular flow economic model, unifying sustainability and economic viability.

As the process is very important to the Eco-region, they decided to establish a monitoring system of the 'Eco-region' process and the achievement of targets. In order to monitor the key variable CO₂, a scientific partner (JOANNEUM RESEARCH) was assigned to develop an objective and transparent assessment system, the so-called online CO₂ calculator.

This tool is providing the yearly CO₂ balance of the 'Eco-region' and compares it to the past and the targets set. The 2006 values serve as monitoring base. The calculation model was tailor-made for the 'Eco-region'.

The sector data for Private households, Public buildings, Agriculture and Business are presented per sector. Data collection is done via questionnaires that are distributed by 'Eco-region' responsables and may be downloaded from their webpage. Data is collected every 2 – 3 years (2006, 2008, 2011 so far). Results are not being published to the public in detail, but extrapolated tendencies for

the single sectors are presented.

Between 2006 and 2008, CO₂-equ-emissions could be significantly reduced. This is mainly interpreted as caused by a massive shift to green electricity. Further emission reductions could be observed in the fields of heat generation and consumption behavior.

The interpretation of results by the 'Eco-region' is influencing the adaptation and re-orientation of the working programmes. All persons who contributed by filling in a questionnaire are provided with their personal CO₂ balance.

Results

Awareness building

The 'Eco-region' Kaindorf was labelled a "FAIRTRADE" region in 2011. Workshops in schools dealt with the story and importance of fairtrade footballs. The importance of regional consumption is highlighted by common projects with retailers on climate friendly shopping. In cooperation with partner retailers, and in order to ban plastic bags, a successful plastic replacement competition took place. It was observed that inner-region shopping increased steadily.

Awareness on climate protection is expressed by regular climate talk events with experts and the very popular yearly awareness raising event "24 hrs biking for climate protection" with over 1000 international participants.

Information brochures and a regional Newspaper "Einblick" (6 times/yr.) are edited by the eco-region stakeholders.



Mobility

A strong focus is set on promoting cycling: bicycle and foot paths have been developed, financed by Styrian and national funds; a bicycle club has been founded and is supported by the region; a bicycle shop and garage opened in the region.

Another focus was alternative power: an E-scooter shop was opened and promoted electromobility in the region; together with incentive prices for E-scooters; a garage specialising in conversion of cars to biofuel; a biofuel filling station have opened; a regional mobility concept was established.

Buildings

A network for advice on energy-saving improvements, and energy efficient and eco-friendly refurbishment, and related financial incentives was established. The region organised talks and personal advice on energy efficient building, and discounts were offered by regional enterprises. An insulation show house opened.

Heat and electricity

In the meantime, all public buildings are equipped with CO₂ neutral heating. The entire Eco-region is supplied with 100% CO₂ neutral electricity.

Photovoltaic plants have been installed on all suitable public buildings. A photovoltaics investment company was funded, with citizens becoming shareholders. Where technically and economically appropriate, small renewable Bio-energy power plants were constructed, and respectively energetically improved. The region supports energy efficiency measures (as they are proposed by Styria-wide and Austria-wide programmes, see *Figure 7*) offering higher grants than most other communities.

Energy saving/water

Individual households in the region that request energy saving advice get a discount on their energy bills. This is also true for those who request thermography measurements and "energy passes".

The leasing of devices to measure energy consumption is free of charge. In a pilot project, the optimisation of street lighting during night time was tested (e.g. lighting could be activated on demand by SMS).

Agriculture and humus build-up

A set of interconnected activities linked to humus has been taking place. Expert meetings and international conferences on humus are regularly organised in the region. Information days for farmers to keep them updated on humus practices take place, where they are assisted and discounts are provided on soil diagnostics if they commit themselves to humus.

Agricultural test and demonstration sites for humus and its benefits have been installed under scientific supervision, where also field tests on biochar for soil improvement and CO₂ fixation take place. A Pyreg test plant produces biochar.

With big retailers, long term cooperation has been agreed upon: selected farmers are producing vegetables humus surfaces; a local CO₂ trading system for enterprises was established where enterprises buy certificates from farmers who humus.

Outcomes

It can be observed that nearly all central problems related to GHG emission, and core areas of activity in the Eco-region, correspond to the key aspects that were also identified for the region of Styria. Findings and initiatives from the Eco-Region illustrate detail at a local level. This illustrates that, on the one hand, the Eco-region is aware of the interdependency and complexity of emission problems; on the other hand it shows that activity is concentrated on topics that are within the Eco-region's scope of action.

Mobility for instance, is a key problem area: the main – legislative and financial – power to change things, however, lies within other levels of decision making process, i.e. the region of Styria and the state of Austria.

On the contrary, a strong focus in this region, rich in agriculture, focuses on Agriculture/

Humus formation, where it is up to individuals to set the measures. In this context, it is quite interesting that the 'Eco-region' decided to concentrate on a subject that is still not scientifically proven (Humus formation as CO₂ sink, biochar), and requires a lot of additional research.

This leads to the formulation of another strength of the Eco-region's approach: to be open for innovative solutions and activities, and open to learn from failures. The latter is explicitly formulated in the Eco-region's general principles. A look at the list of activities, where an interesting mix of established measures and innovative approaches may be found illustrates this permanent learning process.

A definite strength is the existing "*sense of togetherness*" and support from the population of the Eco-region. It appears that leading promoters, such as mayors and *key stakeholders are on the same wavelength*. Even if there is an apparent functional and clear organisation structure within the association, the role of these promoters for the implementation of the targets should not be underestimated. It's only on this basis that it is possible to set common clear budget preferences and agree on common funding for activities.

The marketing of the Eco-region and its approach outwardly has been quite successful, and additional funding at provincial, national and EU level has been acquired. This financial "success" is without any doubt as motivating as a considerable *number of services and discounts the Eco-region provides* for members (more than 30 discounts).

One of the key aspects of success is *the strong involvement of local enterprises*. Nearly all firms and tourism enterprises are members of the 'Eco-region Kaindorf'. Many of them are active members in terms of a) sponsoring; b) active project partner; and c) offering discounts. At the same time, they also take benefit from the 'Eco-region', as new business ideas and niche products may be supported and the regional consumption idea is promoted.

Nevertheless, any ambitious target set in this context may encounter limitations in practice

‘Especially if people are asked for input that does not result in immediate tangible benefits, their motivation for this input may shrink over time’.

In the case of ‘Eco-region Kaindorf’, the quantitative monitoring of data lags behind other activities. No CO₂ calculator results for the period after 2008 are available as the questionnaire has not been administered. According to the manager of the Eco-region, the planned 2011 survey was postponed for financial reasons. Later on, it was decided to wait for a foreseeable fusion with an additional community. In the meantime, as additional funding by a federal programme could be achieved for 2014, the survey should take place this year ⁷.

4. CONCLUSIONS

This case study demonstrates what can be undertaken in a coordinated way, in the short term; medium term; and long-term; to combat climate change and GHG emissions at small regional level. Considering that in Styria, there are several regions where local communities with similar characteristics are working together⁸, there is a potential to enlarge the concept to incorporate other areas. Nevertheless, this might only be successful when most of success factors mentioned above may be observed.

As the ‘Eco-region Kaindorf’ is working in a specific setting that is characterised by intense human interaction in a relatively small area, any enlargement to the whole of Styria seems unrealistic.

The ‘Eco Region Kaindorf’ is seeking for exchange on similar approaches and is willing to share experiences with other regions. They are partners in an ongoing EU project called Solution (Part of Concerto III initiative). Their aim is to further develop approaches of regional energy autonomy in the long term.

FOOTNOTES

1. Wikipedia, 22 October 2013.
2. “Domestic” includes: public and private services, private households, agriculture.
3. Data: Stromnetz Steiermark 2013; does not

include energy self-supply of industry or energy suppliers.

4. Calculated for a mix of: 6% coal, 2% oil, 20% gas, 65% hydropower, 8% other renewables, 1% nuclear, 1% other.
5. All subsequent data: Ökoregion Kaindorf Web page.
6. Basic assumption: A humus build-up of +3% in the upper layer <25cm bonds 125t. CO₂ / ha.
7. Personal communication Mr. Ninaus, February 2014.
8. As in Styria, there is an important community fusion programme ongoing, this potential might change to the better or the worse.

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