

A SWOT Analysis for Renewable Energy Sources and Energy Efficiency in the Kleinregion Entwicklungsverband Tullnerfeld West#



Center of Excellence for Renewable Energy, Energy
Efficiency and Environment

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1. INTRODUCTORY REMARKS

The elaborations presented in this document are based on the joint SWOT methodology designed in the context of the VIS NOVA-project and combine qualitative assessments in the form of expert interviews with quantitative data mostly on energy related issues.

Especially with regards to the later, a person interested in statistics on energy consumption and generation from renewable energy sources on the level of communities might encounter several challenges if not for regional energy concepts, which in Austria's rural communities are almost exclusively formulated in the context of the LEADER-program for financial reasons. On the one hand, these concepts per se provide excellent insights into manifold aspects of the region they are tailored for; on the other hand, comparability between them might be very limited. That certainly hold true for the region Tullnerfeld-West: 10 of the 12 communities are part of the LEADER-region Donauland-Traisental-Tullnerfeld, Tulln an der Donau itself belongs to the LEADER-region Kamptal-Wagram, and finally, Muckendorf-Wipfing is not part of any such group. Where possible, we tried to sort out incommensurabilities through additional data, most importantly Statistik Austria' "Blick auf die Gemeinde" (which could be translated as "a look at the community"). Where this was not possible, the report will highlight the omission.

A final word on the sources employed before the fun starts: Apart from the “Blick auf die Gemeinde” publications, we relied heavily on data provided by Statistik Austria that is also available online: national accounts, total energy balance for both Austria and Lower Austria, census data, and many more. These are not displayed in the bibliographic section, but can all be found online via www.statistik.at.

2. REGIONAL PROFILE

The so-called “Kleinregion Tullnerfeld-West” comprises 12 of a total 21 communities of the Tulln district (in alphabetic order: Atzenbrugg, Judenau-Baumgarten, Königstetten, Langenrohr, Michelhausen, Muckendorf-Wipfing, Sieghartskirchen, Sitzenberg-Reidling, Tulbing, Tulln, Würmla, and Zwentendorf) located in central Lower Austria, to the northwest of Vienna.

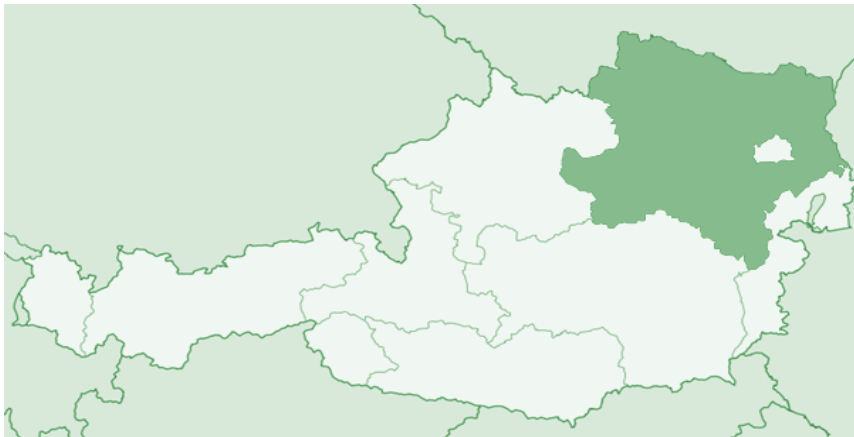


Fig. 1 Location of Lower Austria within Austria

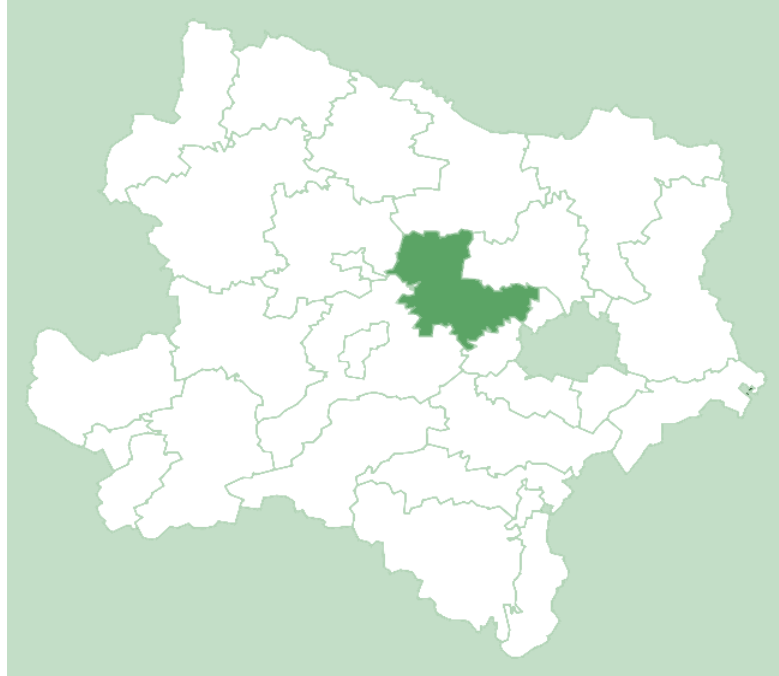


Fig. 2 Location of Tulln district within Lower Austria

Covering an area of approximately 360 km², and inhabited by about 45 000 people, it is the smallest of geographic units participating as a region in the VIS NOVA-project. Table 1 shows how population and area are split between the communities:

	pop	km ²	pop/km ²
Atzenbrugg	2545	26,01	97,85
Judenau-Baumgarten	2139	14,31	149,48
Königstetten	1980	13,14	150,68
Langenrohr	2312	22,55	102,53
Michelhausen	2612	32,01	81,60
Muckendorf-Wipfing	1315	6,34	207,41
Sieghartskirchen	7094	61,68	115,01
Sitzenberg-Reidling	2058	22,14	92,95
Tulbing	2868	18,35	156,29
Tulln	15037	72,23	208,18
Würmla	1252	20,44	61,25
Zwentendorf	3925	53,75	73,02
total	45137	362,95	124,36

Tab. 1 population and area per community 2011

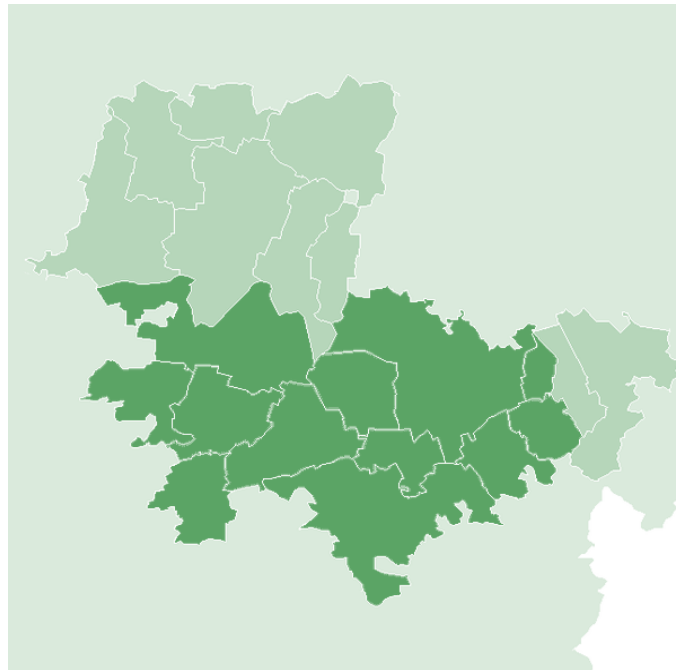


Fig. 3 Communities collaborating as „Tullnerfeld West“

While elements of (sub-)urbanization are evident not only in the town of Tulln an der Donau itself, but slowly take hold in proximity to the Austrian capital, the region is still largely characterized through features typically associated with rural areas. This theme of an intermediate position or semi-peripheral location will reoccur throughout this report.

2.1. DEMOGRAPHY

When we talk about “structural change” in European rural regions, for most of them, considered either unsuccessful or unlucky in adapting, we’re merely employing a euphemism for them seemingly being trapped in an autocatalytic process of economic stagnation or decline on the one and dwindling and aging populations on the other hand. From a demographic perspective, the region Tullnerfeld-West certainly finds itself on the side of fortunate adapters: within the last 2 decades, the total number of people inhabiting the region not merely increased, but did so by almost a quarter (22,5%) - not a single one of the 12 communities suffered a decline. The slowest growing community, Würmla, pretty much equalled the growth rates of all of Austria (7,6%). A number of 6 communities witnessed increases in the 20s. Even those rates are, however, dwarfed by the whooping numbers of Langenrohr (38,1%) and Muckendorf-Wipfing (48,4%, albeit on a pretty low total level: from 886 inhabitants in 1991, the community grew to 1315 people last year).

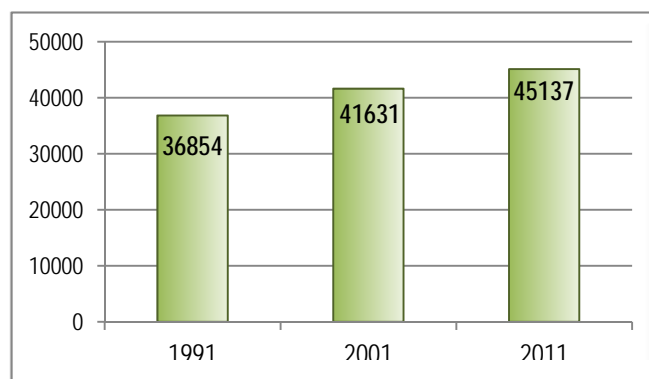


Fig. 4 Total populations Tullnerfeld-West

	1991	2001	2011
Atzenbrugg	2322	2497	2545
Judenau-Baumgarten	1713	2075	2139
Königstetten	1635	1888	1980
Langenrohr	1674	1974	2312
Michelhausen	2379	2524	2612
Muckendorf-Wipfing	886	980	1315
Sieghartskirchen	5812	6674	7094
Sitzenberg-Reidling	1701	1921	2058
Tulbing	2250	2534	2868
Tulln	12038	13591	15037
Würmla	1164	1258	1252
Zwentendorf	3280	3715	3925
total	36854	41631	45137

Tab. 2 total population figures per community and year and percentual growth from 1991-2011

growth % 1991-2011

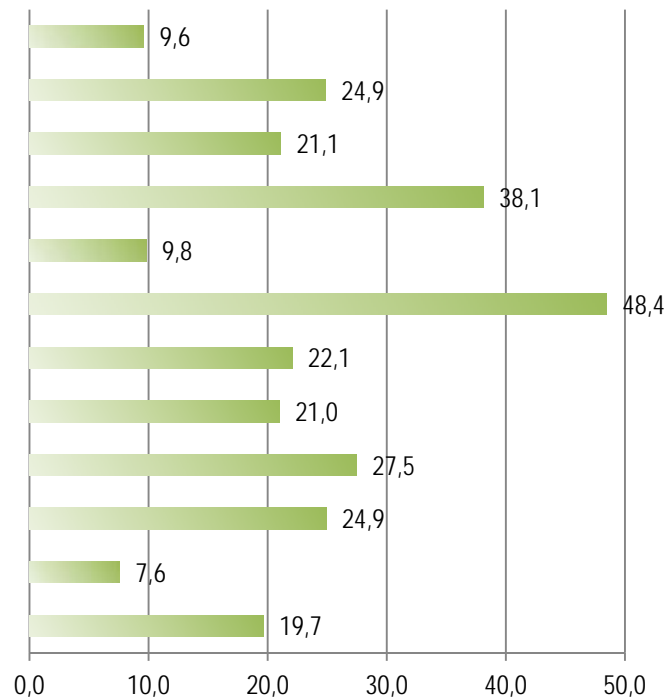


Fig. 5 Total population figures per community and year and percentual growth from 1991-2011

If there's anything to the widely accepted model called "demographic transition", it's hard to imagine such a surge in counted population as primarily owed to the interplay of regional fertility and mortality anywhere in Europe. This also holds true for our region:

From 2002 until 2011, in most communities (8 of 12) the fertility rate slightly topped the mortality rate, though not necessarily each and every year; still, the total birth balance for the region during that time shows a minus of 409 bodies, mostly due to the city of Tulln itself,

where exactly 711 less children were born than people died. Also noteworthy seems the case of Langenrohr, which not only attracted a significant number of intra-regional and national migrants, but also features the birth balance with the highest total plus of all 12 communities. Especially for those smaller, rural communities, this without a doubt has to be an encouraging sign, finding themselves amongst the few in Europe that on paper support a self-sustaining population. The difference maker, however, has to be migration to the region, as the region has become a destination of domestic migration starting in the 1970s.

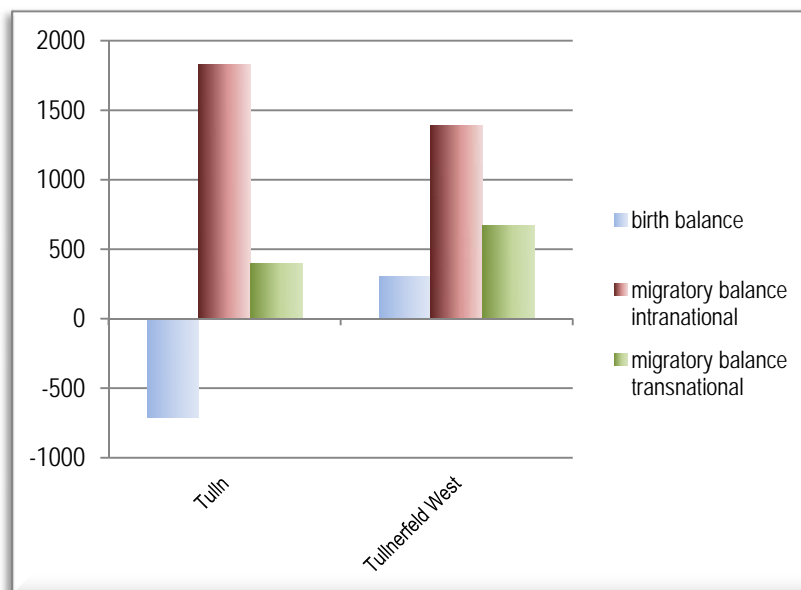


Fig. 6 changes in population according to birth and migratory balance for the town of Tulln and the whole region

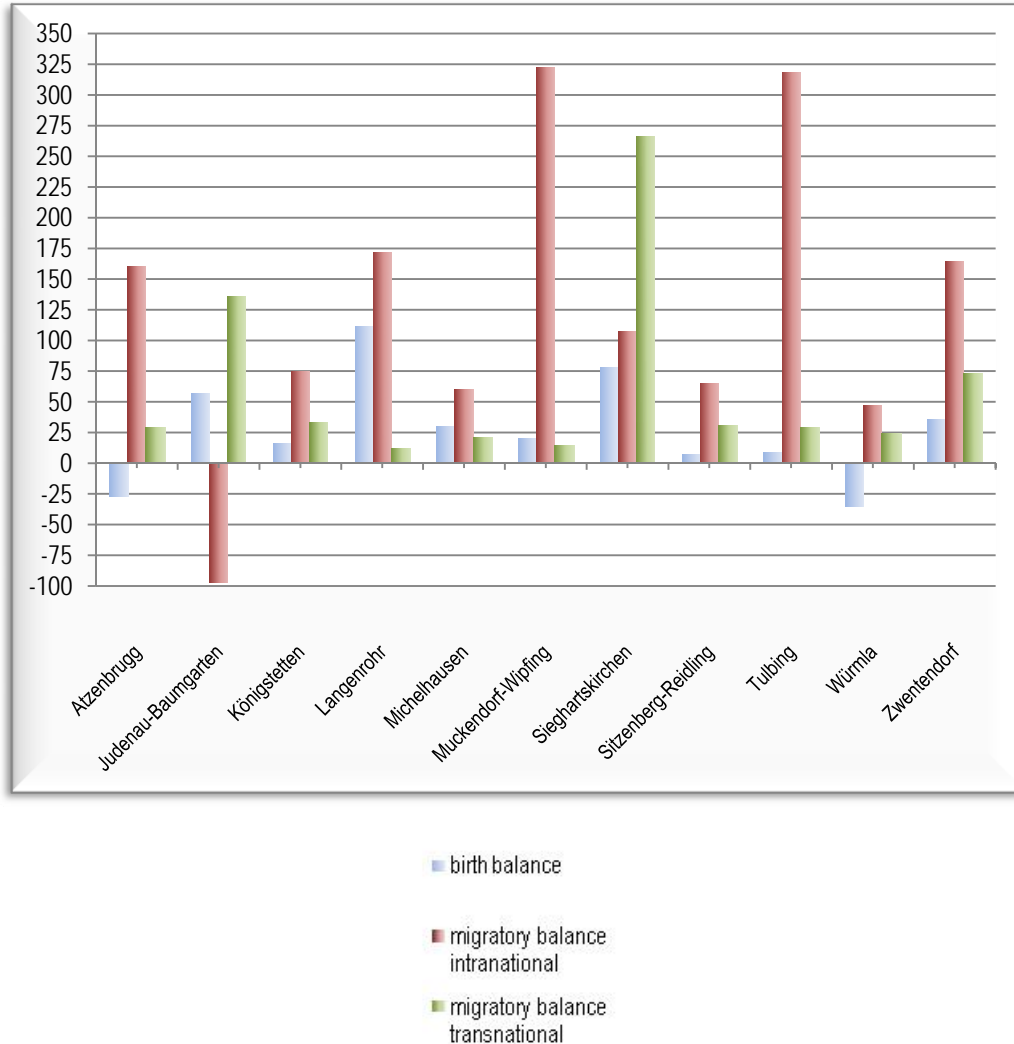


Fig. 7 changes in population according to birth and migratory balance for the remaining communities

Concerning the regions age structure, we see a relatively stable stock of people in their working age, who account for slightly more than two thirds of the total population throughout the last decade. There is,

however, a shift in relative sizes from populations aged under 15 years to the group of 65+ that top that same process on a national level in its extent.

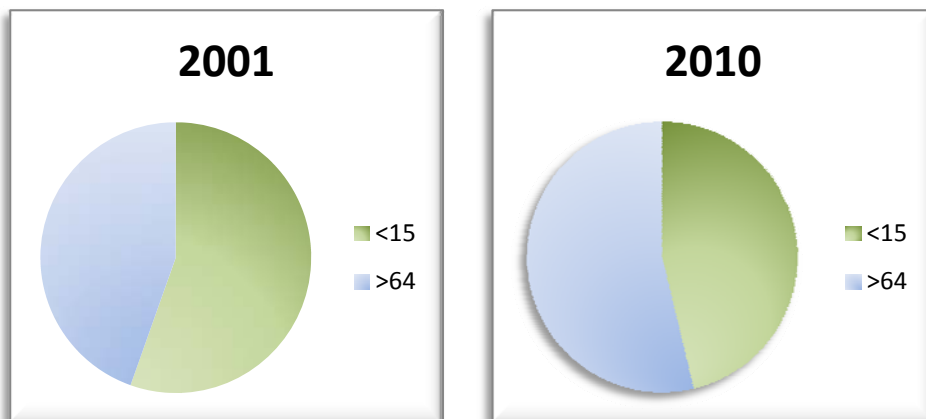


Fig. 8 Comparison of shares of youngest and oldest age-clusters in 2001 and 2010

Altogether, these indicators underpin the evidence for a process of suburbanization taking place in parts of the region Tullnerfeld-West, a fact also mirrored in transport activities and policies that link especially the town of Tulln ever closer to Vienna.

In conclusion, the region Tullnerfeld-West demographically finds itself in a privileged position compared to the majority of European rural communities

2.2 SOCIOECONOMY

The region Tullnerfeld-West as part of the NUTS-3-region “Wiener Umland-Nordteil” generated a Gross Regional Product of 23 700 €/capita in 2009, which ranks sixth among the NUTS-1-Cluster Eastern Austria. During a period of global economic downturn, the region from 2007 to 2009 managed to increase its GRP by 3,5%, a value second to only Sankt Pölten in Eastern Austria. It has to be stressed, however, that this is the result of a growth of 8,3% from 2007 to 2008, which has been largely nullified already in 2009.

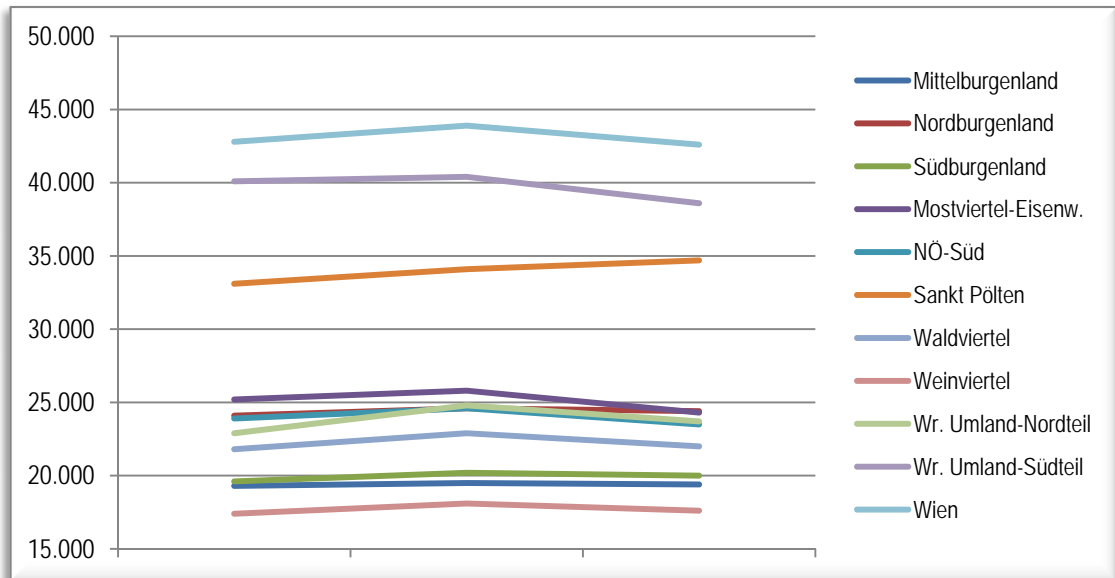


Fig. 9 Development of GRPs/capita per NUTS-3 region in Eastern Austria 2007-2009

Following the International Labour Organization’s Labour Force Concept for classification, the unemployment rate during that same

year 2009 crossed the mark of 4%, which, not only considering the challenges and imponderabilities presented by the global economic framework, still is a remarkably low value. Women, and one could assume it's not an especially new phenomenon, are more likely to lose their jobs, featuring an unemployment rate of 4,3% compared to 3,9% for males. Reasons for this, as highlighted in the yearly reports on gender equality by the Austrian Office of the Federal Chancellor, include a relative prevalence of part-time and precarious jobs concentrated in only a handful of sectors typically constructed as "female" and, quite tellingly, significantly worse remunerated, as well as the fact they still, and with only marginal progress so far, bear the brunt of child-rearing. Furthermore, their working force participation rate remains considerably lower than that of their male counterparts.



Fig. 10 Comparison of total population and potential labour force by gender in the region

3. REGIONAL ENERGY CONSUMPTION

Energy consumption in the region Tullnerfeld-West displays a split between the 11 rural communities and the town of Tulln, a center of the production of goods of transregional importance: annual consumption reaches figures in the range of 20 to 30 MWh per capita in the former, values indicating that energy consumption is mainly driven through the requirements of private households in contrast to local economy. Tulln an der Donau, on the other hand, used around 60 MWh per capita in the year 2008, for which the most recent data is available, mainly due to its potent secondary economic sector. While accounting for roughly a third of the region's population, more than half the end energy used in Tullnerfeld-West is used in Tulln.

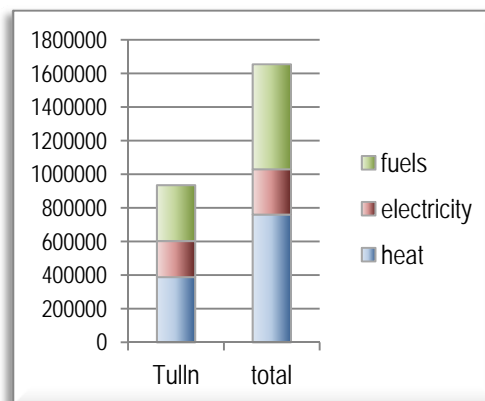


Fig. 11 end energy consumption in Tulln and the whole region according to usage in MWh/a

The consumption of fuels for uses of transportation is, in some communities (especially Judenau-Baumgarten, Königstetten and Langenrohr), high relative to other Austrian communities of comparable socioeconomic characteristics. It is assumed that this results from a large number of commuters, first and foremost to Vienna, within these communities.

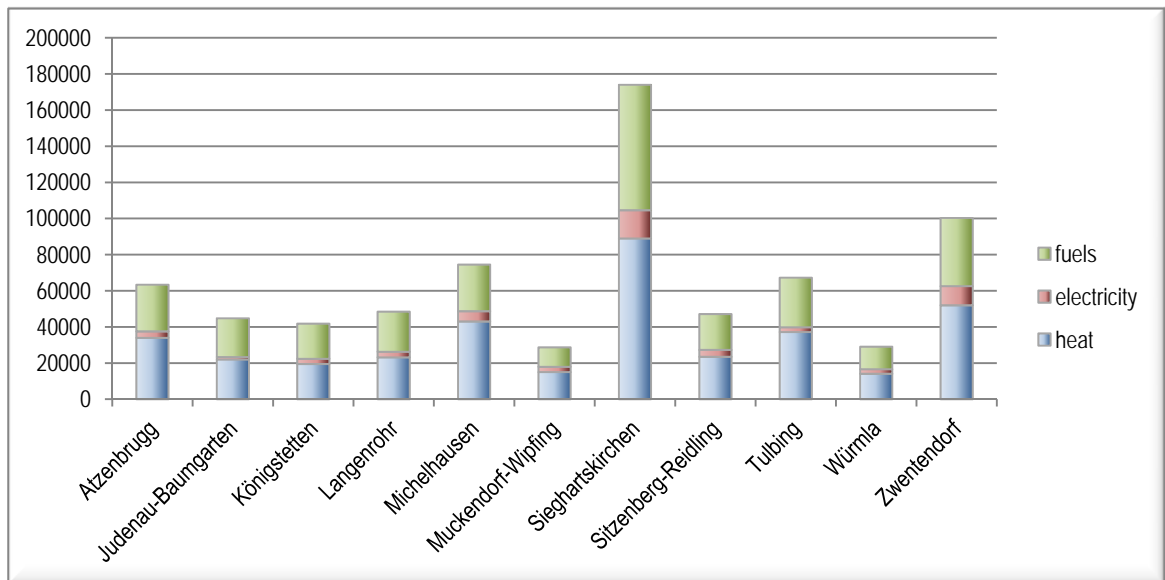


Fig. 12 end energy consumption in the whole region according to usage in MWh/a

4.1 CONSUMER GROUPS

Since reliable data on where exactly these amounts of end energy are used are not available on a community level, the following elaborations focus on the NUTS-2-region of Lower Austria, which Tullnerfeld-West is part of.

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The data provided by Statistik Austria allows not only a differentiation between the 3 economic sectors and private households, but also shows separately the energy consumption for uses of transportation. Since mobility by design is mostly an afterthought in the context of the VIS NOVA project, this classification suits our purpose well.

What we find is that, while overall consumption increased by approximately 58% from 1990 to 2010, the primary sector, which throughout Lower Austria is traditionally dominated by agricultural production, remained relatively stagnant, with end energy usage growing 5,4%. Private households, whose energy requirements peaked in the middle of the 1990s, during those two decades increased their energy consumption by 17% - it must be noted, however, that the population growth in Lower Austria during that time was not even half as high as in Tullnerfeld West – 9% compared to 22,5% – which leaves one assuming a significantly higher increase for our region. The largest relative increase can be found in the services sector, which also includes public services and administration. While still low in absolute

values, this sector today needs 230% of the end energy consumed in 1990.

As figure 13 shows, the main driver for increased energy consumption is transportation, featuring the highest absolute and second highest relative increase, and accounting for more than 38% of today's overall end energy consumption.

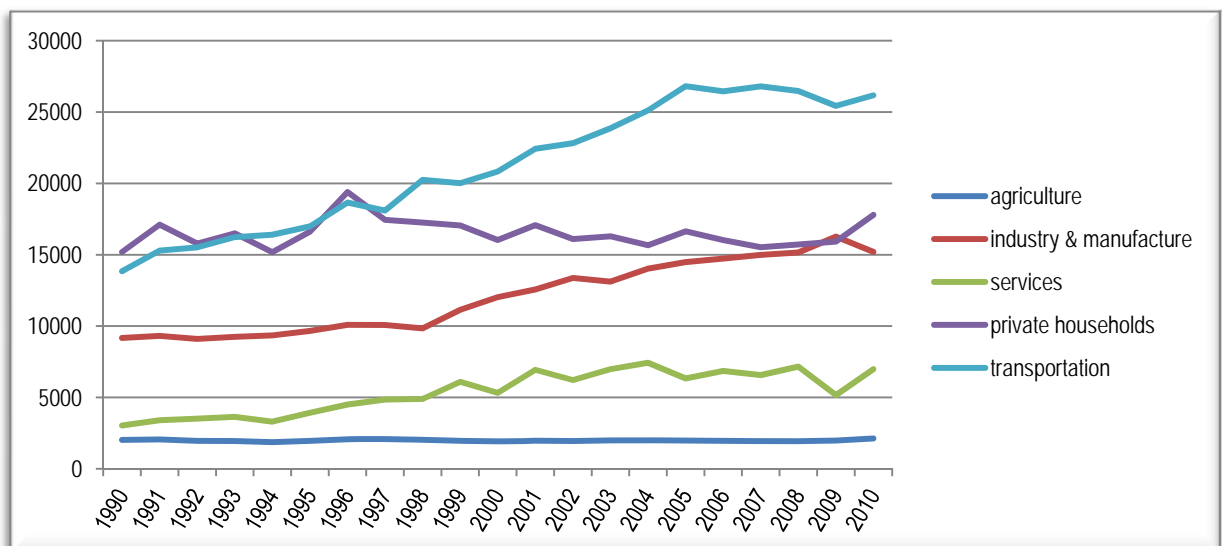


Fig. 13 development of end energy consumption in GWh/a in Lower Austria according to consumer groups

As has been noted on numerous occasions, most prominently in the yearly energy reports by state and federal authorities, the crucial decoupling of economic growth and energy consumption remains

mostly a promise and goal; stagnation and decreases in energy consumption in any sector from year to year are indicators for a reduction of economic activities rather than a jump in energy intensity and efficiency. We shall further discuss this issue in chapter 6.

While this finding is certainly more of a sobering kind, it is only a part of a larger picture that also shows a lot of progress that has been made. This certainly hold true when we take a look at yet another part, namely which energy carriers are employed for energy generation.

3.2 ENERGY CARRIERS

With regards to the energy carriers used to provide for energy demands, we see a significant decline in the importance of fossil oil and its derivative products. Renewable energy sources and teleheating, not least to increasing political efforts and subsidies, display a continuous and strong growth.

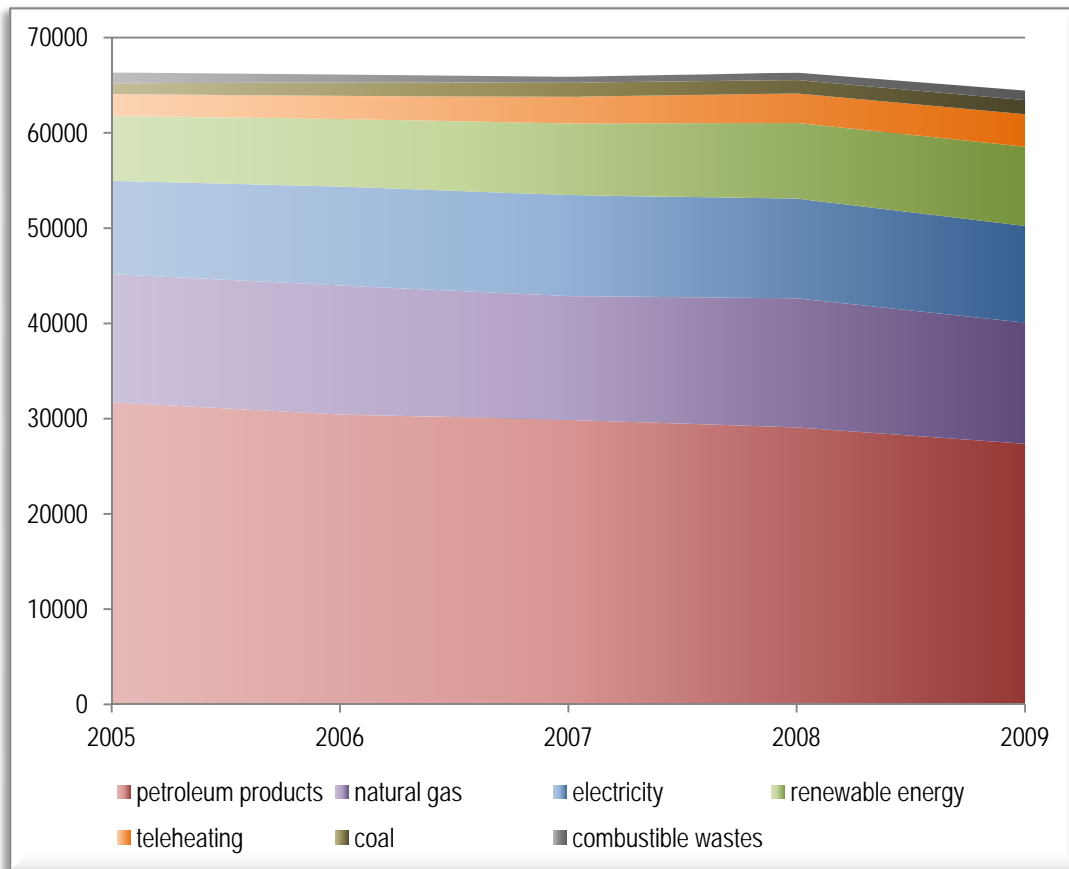


Fig. 14 end energy consumption according to energy carriers

There is, however, a small yet significant drop of bitterness that comes with these developments: In contrast to the national trend, the use of energy created from coal is growing in Lower Austria, albeit from a low level. From 2005 to 2009, coal was the energy carrier with the second highest growth rate.

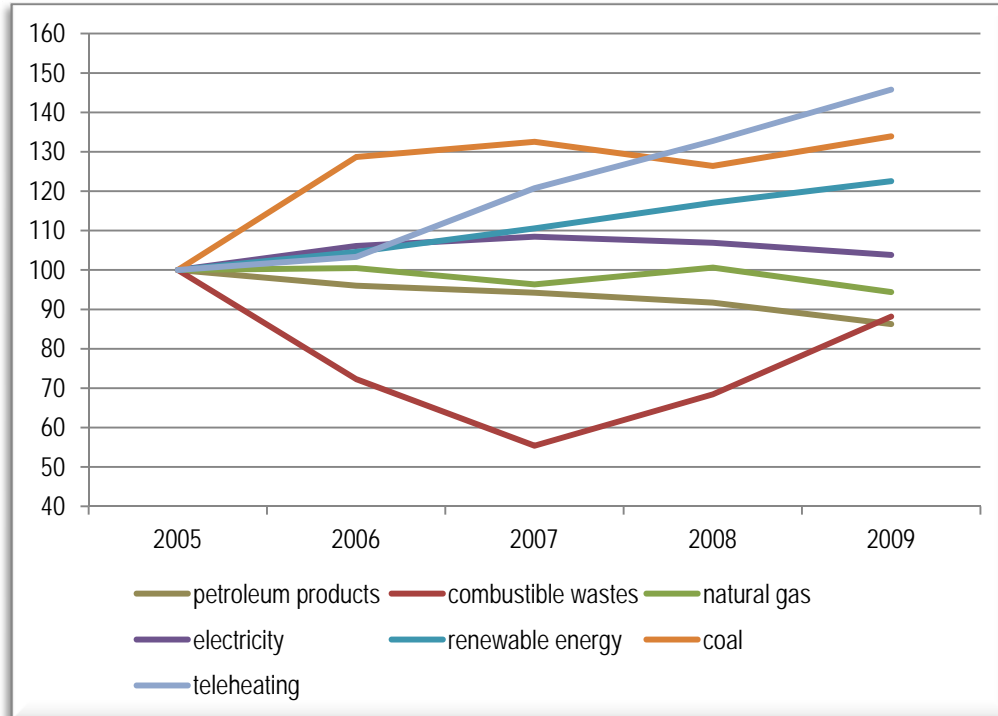


Fig. 15 Indexed developments of the use of energy carriers to provide end energy in Lower Austria 2005-2009 (2005=100)

4. RENEWABLE ENERGY PRODUCTION

As we have seen, energy generation from renewable sources is on a rise in Lower Austria. That tendency also applies to the region Tullnerfeld-West, and the following section serves to trace its impact on the status quo as well as to assess the potential for further expansion.

4.1 STATUS QUO

Regional energy generation from renewable sources is quite unevenly distributed among the 10 communities that provide secondary data on the issue. 6 communities provide less than 3% of the electricity they use in end energy, are therefore on the road to only a marginal role in the Lower Austrian federal government's plan to generate as much electricity from RES as the state uses. Sitzenberg-Reidling, on the other hand, already produced way more than twice (236,7%) its own required electricity, all that in pretty much just one biogas plant of 1 000 kW power. While not yet theoretically self-sufficient in this context, both Tulbing and Zwentendorf have taken significant steps to follow suit.

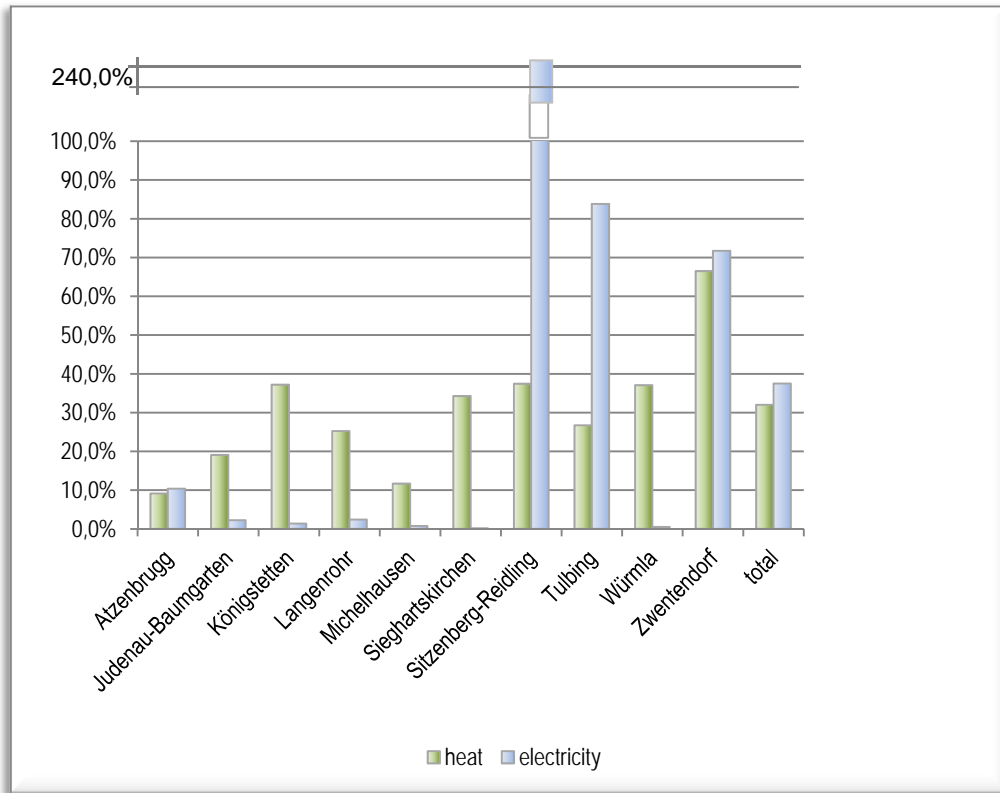


Fig. 16 RE-coverage rates of communities' respective end energy consumption (without Muckendorf-Wipfing and Tulln)

Zwentendorf also takes a leading role in the region when it comes to the generation of heating energy with approximately 35 000 MWh per annum (followed by Sieghartskirchen with slightly more than 30 000 MWh p.a.) as well as in the production of fuels from RES, featuring the region's only bioethanol-plant.

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To put these numbers in perspective, the total production of the 9 analyzed communities merely equals 14,3% of the energy consumption of the town Tulln.

4.1.1. RE-plants in the region

High-capacity plants in the region exclusively use biomass, either for combustion or power generation from biogas, all of which were built after 2000. The following tables display the locations and power of teleheating-plants (tab. 3) and biogas-plants (tab 4):

teleheating	
location	power in kW
Judenau-Baumgarten	320
Sieghartskirchen	500
Sitzenberg-Reidling	1000
Tulbing	250
Zwentendorf	6000

Tab. 3 teleheating plants in the region

biogas	
location	power in kW
Sitzenberg-Reidling	1000
Tulbing	250
Zwentendorf	620

Tab. 4 biogas plants in the region

4.2 RENEWABLE ENERGY POTENTIALS IN THE REGION

The following elaborations are based on the analysis of renewable energy potentials in the regions as presented in the regional energy concepts for the communities' part of the region. In this context, the term "potential" implies realistic (i.e. also taking into account economic and political factors) potentials rather than theoretical or technical potentials; the values calculated are therefore more constrained. Values for the geothermal potential of the region were optimized accordingly. Biomass potentials for the communities Muckendorf-Wipfing and Tulln an der Donau were no applicable due to incommensurable quantification.

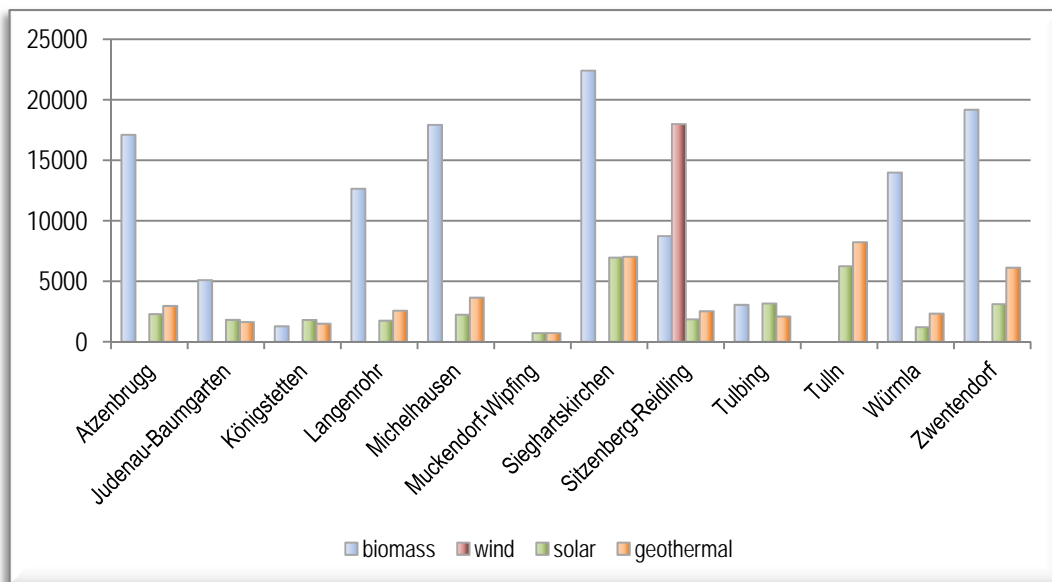


Fig. 17 Potential of Renewable Energy Sources in the region in MWh/a

Biomass is the energy carrier with the greatest potential for energy generation from RES in the region – by a landslide, as it accounts for 56% of the overall potential. This seems even more striking since the presented numbers encompass only silvicultural and agricultural biomass as such produced for energy generation, but no organic by-products or wastes. Tullnerfeld-West furthermore has a decent potential for geothermal heat production; one should, however, keep in mind the uncertainties, if not impossibility, of assessing the economic viability of this RES in for a whole region in general rather than case-specific.

The potential for solar energy is slightly above average in a national, Austrian context, which is good news considering the infrequent, but generous subsidies one can acquire for both solar thermal- and photovoltaic-installations. Yet, we find ourselves confronted with the paradox situation that, while collector surfaces are rapidly expanding throughout Austria, they only account for a marginal share of renewable energy generated.

This paradox is turned to its head when we talk about wind energy. Legal and administrative obstacles in the form of protection zones, relatively low feed-in-tariffs, and, according to the experts interviewed, somewhat tedious approval procedures hinder its spread, and in the case of our region, combined with considerations on economic feasibility, factually limit it to just one area in the community Sitzenberg-Reidling.

These same reasons also provide an answer for the puzzling fact that, in a region traversed by the Danube, there would be no potential for water power.

A comparison of these RES potentials with current end energy consumption has one paint a sobering picture: The potential is only about a fifth of the end energy already used. Granted, as has been mentioned, we lack the biomass potentials of 2 communities, and find rather conservative estimations throughout the assessments. However, there is no way to bridge this gap statistically. What would is a) technical improvement in RES-plants, b) a reconsideration of certain energy-related policies, and c) increased efforts to boost energy efficiency.

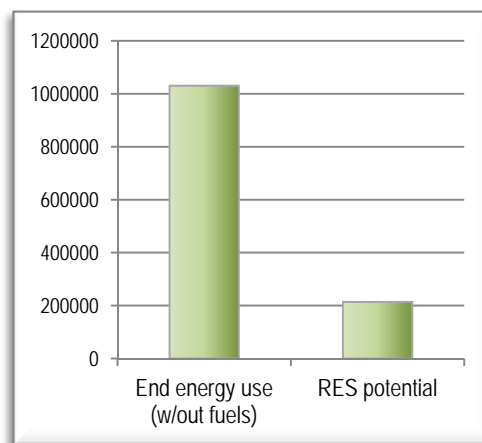


Fig. 18 Comparison of enrgy usage and RES potential in MWh/a

5. ENERGY EFFICIENCY

5.1 ECONOMY

It has often been defined as one of the main challenges the western world faces today: the decoupling of economic growth and energy consumption. Toto pro pars, a look at the Austrian development reveals the crux of this endeavor: While the energy intensity rose steadily, this did not lead to a decrease in energy usage, since the gross domestic product grew even faster. In other words: from 1995 to 2010, the Austrian GDP grew by almost 64%, while the relative energy consumption per \$ GDP plummeted close to 22% during that same period, resulting in an increase of 28% in gross domestic energy consumption. There's a plethora of examples from all parts of the world, actually even throughout history, that document how gains in efficiency hardly, if ever lead to overall savings, but instead prepare the ground for a further perpetuation of economic activities.

It is also against this background that a growing number of people question the very premise of economic growth; wherever the road will lead us, it's certainly not a problem the region Tullnerfeld-West can solve on its own.

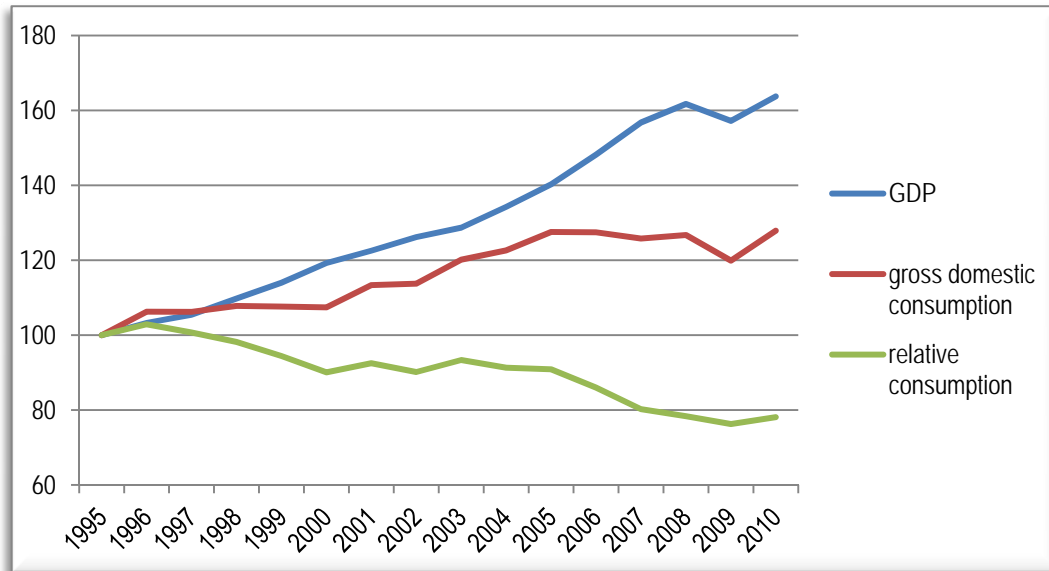


Fig. 19 Indexed development of GDP, gross domestic consumption and relative consumption in Austria, 1995-2010 (1995=100)

5.2 PRIVATE HOUSEHOLDS

The building stock of the region Tullnerfeld-West presents itself in relatively good shape, compared to other rural regions of Lower Austria. In 11 of the 12 communities, at least a fifth of the buildings are no older than 21 years, the only exception being Muckendorf-Wipfing, which only slightly misses the mark at 18%. As if that were not remarkable enough, experts inform us that there's also considerable effort in renovation & sanitation, especially in the form of changing/upgrading windows and loft insulation.

Nevertheless, there's room for improvement: Especially low income groups tend to occupy older and not (sufficiently) insulated homes, often lacking the resources for even basic measures. It is this socioeconomic split that is completely ignored by subsidy programs, both with regards to renewable energy generation and energy efficiency.

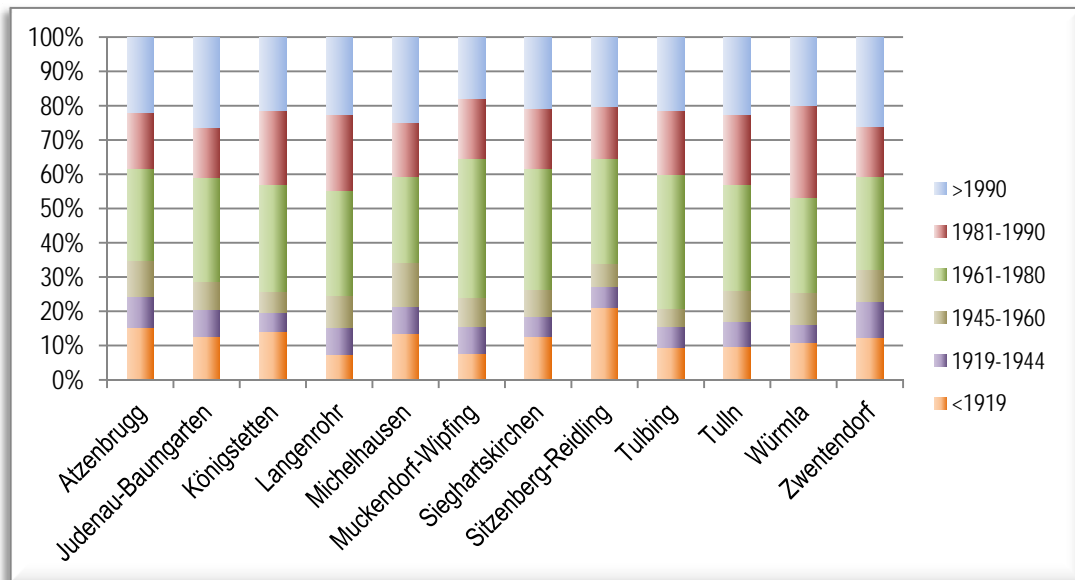


Fig. 20 Building stocks in shares of building periods

6. CONCLUSION: SWOT

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6.1 STRENGTHS

- Beneficial demographic development: Among the fastest growing regions in Austria, no loss of population in working age
- Potent economy with the regional urban center of Tulln, transregionally Vienna
- Intercommunal cooperation (not only) on matters of energy, waste & water management
- Landwirtschaftliche Fachschule Tulln as link to scientific state of the art and driver of it's application
- Active private individuals engaging in governance processes on energy policies on the local level
- Importance of teleheating

- Numerous regional best practice-cases with both solar power and biomass/-gas
- Good utilization rate and growth of manifold forms of biomass
- High popularity and installation rate of PV- and solar thermal-collectors not only, but especially among private persons
- High share of buildings built after 1980 in total building stock
- Widespread upgrading windows and loft insulation
- Broad range of consultancy, in case of Energieberatung NÖ practically free for private persons (except travel costs)
- Existence of private financing models benefiting especially insulation and sanitation of private homes

6.2 WEAKNESSES

- ❖ Lacking cooperation between political authorities and enterprises
- ❖ Lacking involvement of private persons in most fora of energy policy coordination
- ❖ Strained budget situation in the communities
- ❖ No water power plants (possible), although the Danube river crosses parts of the region
- ❖ Low public acceptance of wind energy, and, accordingly, no large wind power plants
- ❖ Geothermal energy mostly an afterthought (high installation costs, low subsidies?)
- ❖ No instruments to counter socioeconomic split in affordability of both RE-installation and EE-measures

6.3 OPPORTUNITIES

- ✔ Clear vision & goal definitions with regards to RE&EE from higher administrative levels
- ✔ A total of 73 subsidies for RE, EE and environmental protection from federal and nation state
- ✔ Subsidies for residential buildings linked to heating requirement of 36 kWh/a or lower
- ✔ Biomass & -gas, the mainstay of regional RE generation, are focal points of subsidy programs by the federal state Lower Austria

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6.4 THREATS

- ✔ Sometimes arbitrary and lengthy approval procedures for (small) wind energy and water plant
- ✔ Lack of coordination between regions
- ✔ Low feed-in-tariffs for wind energy

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- Global financial crisis potentially affecting power plant operators via credit requirements



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8. TABLES

- Population and area of communities 2010
- Population development 1991-2010:
- Birth- and migratory balance 2002-2011:
- Population according to age 2001 & 2010:
- Gross regional product NUTS-3-regions of Eastern Austria 2007-2009
- Population 2009
- End energy consumption in MWh/a 2009
- End energy consumed according to energy carriers 2005-2009
- Potentials
- Regional development 1990 – 2010
- Heat and Electricity
- Renewable regional energy
- Population <1919 - >1990
- Energyconsumption

Population and area of communities 2010:

	population	km ²	pop/km ²
Atzenbrugg	2545	26,01	97,85
Judenau-Baumgarten	2139	14,31	149,48
Königstetten	1980	13,14	150,68
Langenrohr	2312	22,55	102,53
Michelhausen	2612	32,01	81,60
Muckendorf-Wipfing	1315	6,34	207,41
Sieghartskirchen	7094	61,68	115,01
Sitzenberg-Reidling	2058	22,14	92,95
Tulbing	2868	18,35	156,29
Tulln	15037	72,23	208,18
Würmla	1252	20,44	61,25
Zwentendorf	3925	53,75	73,02
total	45137	362,95	124,36

Population development 1991-2010:

	1991	2001	2010
Atzenbrugg	2322	2497	2545
Judenau-Baumgarten	1713	2075	2139
Königstetten	1635	1888	1980
Langenrohr	1674	1974	2312
Michelhausen	2379	2524	2612
Muckendorf-Wipfing	886	980	1315
Sieghartskirchen	5812	6674	7094
Sitzenberg-Reidling	1701	1921	2058
Tulbing	2250	2534	2868
Tulln	12038	13591	15037
Würmla	1164	1258	1252
Zwentendorf	3280	3715	3925
total	36854	41631	45137

Birth- and migratory balance 2002-2011:

	birth balance	migratory balance		
		intranational	transnational	total
Atzenbrugg	-27	160	29	189
Judenau-Baumgarten	57	-97	136	39
Königstetten	16	75	33	108
Langenrohr	111	172	12	184
Michelhausen	30	60	21	81
Muckendorf-Wipfing	20	322	14	336
Sieghartskirchen	78	107	266	373
Sitzenberg-Reidling	7	65	31	96
Tulbing	9	318	29	347
Würmla	-35	47	24	71
Zwentendorf	36	164	73	237
Tulln	-711	1829	397	2226
total	302	1393	668	2061

Population according to age 2001 & 2010:

	<15		15-64		>64	
	2001	2010	2001	2010	2001	2010
Atzenbrugg	459	331	1665	1773	373	441
Judenau-Baumgarten	436	363	1424	1471	215	305
Königstetten	365	295	1268	1368	255	317
Langenrohr	364	413	1391	1611	219	288
Michelhausen	463	393	1704	1770	357	449
Muckendorf-Wipfing	164	176	664	910	152	229
Sieghartskirchen	1290	986	4507	4868	877	1240
Sitzenberg-Reidling	318	305	1305	1420	298	333
Tulbing	409	379	1760	1907	365	582
Tulln	2258	2164	9297	10283	2036	2590
Würmla	217	170	833	845	208	237
Zwentendorf	634	613	2504	2674	577	638
total	7377	6588	28322	30900	5932	7649

Gross regional product NUTS-3-regions of Eastern Austria 2007-2009:

	2007	2008	2009	change 2007-2009 (%)
Mittelburgenland	19300	19500	19400	0,52
Nordburgenland	24100	24600	24400	1,24
Südburgenland	19600	20200	20000	2,04
Mostviertel-Eisenw.	25200	25800	24300	-3,57
NÖ-Süd	23900	24600	23500	-1,67
Sankt Pölten	33100	34100	34700	4,83
Waldviertel	21800	22900	22000	0,92
Weinviertel	17400	18100	17600	1,15
Wr. Umland-Nordteil	22900	24800	23700	3,49
Wr. Umland-Südteil	40100	40400	38600	-3,74
Wien	42800	43900	42600	-0,47

Population 2009

	Atzenbrugg			Judenau-Baumgarten			Königstetten			Langenrohr			Michelhausen			Muckendorf-Wipfing		
	tot	m	f	tot	m	f	tot	m	f	tot	m	f	tot	m	f	tot	m	f
population 2009	2572	1245	1327	2169	1092	1077	1983	968	1015	2316	1170	1146	2583	1263	1320	1277,0	629	648
potential labour force:	1446	767	679	1134	623	511	1051	555	496	1280	679	601	1393	771	622	668	349	319
... employed	1395	745	650	1093	597	496	1010	536	474	1233	652	581	1341	744	597	647	337	310
... unemployed	51	22	29	41	26	15	41	19	22	47	27	20	52	27	25	21	12	9
non-employable persons:	1126	478	648	1035	469	566	932	413	519	1036	491	545	1190	492	698	609	280	329
... under age 15	349	187	162	386	180	206	309	157	152	422	225	197	386	175	211	177	86	91
... pensioners	515	234	281	390	188	202	405	185	220	392	191	201	511	237	274	296	144	152
... vocational&academic training	102	33	69	87	46	41	104	44	60	87	48	39	107	40	67	54	27	27
... others	160	24	136	172	55	117	114	27	87	135	27	108	186	40	146	82	23	59
non-independently employed	1208	630	578	937	495	442	916	473	443	1072	550	522	1130	614	516	586	296	290
self-employed	187	115	72	156	102	54	94	63	31	161	102	59	211	130	81	61	41	20
labour force participation rate	56	62	51	52	57	47	53	57	49	55	58	52	54	61	47	52	55	49

	Sieghartskirchen			Sitzenberg-Reidling			Tulbing			Tulln			Würmla			Zwentendorf		
	tot	m	f	tot	m	f	tot	m	f	tot	m	f	tot	m	f	tot	m	f
population 2009	7001	3489	3512	2049	1010	1039	2821	1396	1425	14642	7036	7606	1227	629	598	3882	1952	1930
potential labour force:	3686	2011	1675	1109	602	507	1449	777	672	7650	3962	3688	663	367	296	2031	1126	905
... employed	3527	1933	1594	1072	580	492	1393	742	651	7312	3801	3511	640	354	286	1930	1073	857
... unemployed	159	78	81	37	22	15	56	35	21	338	161	177	23	13	10	101	53	48
non-employable persons:	3315	1478	1837	940	408	532	1372	619	753	6992	3074	3918	564	262	302	1851	826	1025
... under age 15	1017	509	508	312	159	153	372	202	170	2171	1137	1034	156	88	68	607	323	284
... pensioners	1511	740	771	400	181	219	675	318	357	3173	1394	1779	286	131	155	819	367	452
... vocational&academic training	302	126	176	88	39	49	121	49	72	676	305	371	50	21	29	121	60	61
... others	485	103	382	140	29	111	204	50	154	972	238	734	72	22	50	304	76	228
non-independently employed	3088	1647	1441	927	494	433	1196	616	580	6713	3425	3288	536	292	244	1780	984	796
self-employed	439	286	153	145	86	59	197	126	71	599	376	223	104	62	42	150	89	61
labour force participation rate	53	58	48	54	60	49	51	56	47	52	56	48	54	58	49	52	58	47

End energy consumption in MWh/a 2009

	end energy consumption in MWh/a 2009			
	heat	electricity	fuels	total
Atzenbrugg	33997	3567	25831	63395
Judenau-Baumgarten	22024	1338	21447	44809
Königstetten	19503	2902	19431	41836
Langenrohr	23194	3111	22163	48468
Michelhausen	43089	5670	25771	74530
Muckendorf-Wipfing	15020	2958	10741	28720
Sieghartskirchen	88989	15659	69390	174038
Sitzenberg-Reidling	23486	3811	19844	47141
Tulbing	37201	2639	27444	67284
Tulln	388501	215006	332254	935761
Würmla	14131	2490	12447	29068
Zwentendorf	52029	10557	37744	100330
total	761164	269708	624507	1655379

**End energy consumed according to energy carriers
2005-2009:**

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	2005	2006	2007	2008	2009
petroleum products	31712	30449	29887	29086	27361
natural gas	13479	13544	12983	13563	12721
electricity	9777	10373	10601	10453	10150
renewable energy	6795	7106	7512	7955	8327
teleheating	2334	2412	2818	3098	3402
coal	1106	1423	1466	1398	1481
combustible wastes	1141	825	632	781	1006

Regional development 1990 - 2010

	agri- culture	industry & manufacture	services	private house- holds	transport- ation	total
1990	2020	9168	3034	15196	13842	43260
1991	2054	9320	3404	17107	15290	47177
1992	1962	9105	3521	15782	15513	45883
1993	1949	9246	3644	16502	16235	47576
1994	1864	9352	3308	15182	16406	46111
1995	1954	9665	3916	16618	16988	49141
1996	2072	10087	4504	19401	18660	54725
1997	2077	10083	4855	17447	18102	52563
1998	2025	9842	4897	17252	20249	54265
1999	1981	11144	6093	17059	20015	56291
2000	1909	12030	5323	16034	20831	56127
2001	1972	12570	6942	17073	22428	60985
2002	1942	13375	6217	16105	22824	60463
2003	1987	13113	6980	16292	23862	62234

	agri- culture	industry & manufacture	services	private house- holds	transport- tation	total
2004	1991	14026	7426	15661	25120	64224
2005	1977	14489	6333	16644	26809	66253
2006	1970	14735	6861	16017	26456	66039
2007	1935	14994	6568	15526	26796	65819
2008	1934	15156	7156	15718	26471	66436
2009	1984	16267	5162	15924	25436	64772
2010	2129	15206	6986	17790	26174	68284

Heat and Electricity

	heat	electricity
Atzenbrugg	3108	370
Judenau-Baumgarten	4200	30
Königstetten	7253	40
Langenrohr	5852	75
Michelhausen	5035	43
Sieghartskirchen	30493	24
Sitzenberg-Reidling	8795	9021
Tulbing	9944	2212
Würmla	5238	13
Zwentendorf	34596	7572
total	114514	19400

Renewable regional energy

	biomass	wind	solar	geo-thermal	total
Atzenbrugg	17111	0	2285	2965	22361
Judenau-Baumgarten	5100	0	1815	1631	8546
Königstetten	1281	0	1808	1498	4587
Langenrohr	12655	0	1749	2571	16975
Michelhausen	17931	0	2239	3648	23818
Muckendorf-Wipfing	n/a	0	721	723	1444
Sieghartskirchen	22413	0	6963	7030	36406
Sitzenberg-Reidling	8735	18000	1856	2523	31114
Tulbing	3053	0	3169	2091	8313
Tulln	n/a	0	6247	8233	14480
Würmla	13991	0	1211	2330	17532
Zwentendorf	19178	0	3117	6126	28421
total	121448	18000	33180	41369	213997

Potentials

year	GDP	gross domestic consumption
1995	174794,20	1.139.773
1996	180560,10	1.211.345
1997	184321,00	1.210.636
1998	191911,30	1.228.647
1999	199266,40	1.226.920
2000	208473,60	1.224.477
2001	214200,90	1.292.348
2002	220529,20	1.296.380
2003	224996,00	1.369.591
2004	234707,80	1.397.724
2005	245243,40	1.453.645
2006	259034,50	1.452.633
2007	274019,80	1.433.856
2008	282746,00	1.444.482

year	GDP	gross domestic consumption
2009	274818,20	1.366.550
2010	286197,30	1.457.662

Population <1919 - >1990

community	<1919	1919-1944	1945-1960	1961-1980	1981-1990	>1990
Atzenbrugg	148	89	102	261	160	212
Judenau-Baumgarten	100	60	64	236	114	206
Königstetten	113	46	49	253	174	171
Langenrohr	54	57	69	222	160	164
Michelhausen	133	76	125	244	154	242
Muckendorf-Wipfing	56	56	59	291	124	128
Sieghartskirchen	368	170	234	1023	516	605
Sitzenberg-Reidling	169	48	53	244	121	161
Tulbing	127	81	72	523	253	285
Tulln	477	355	441	1506	992	1090
Würmla	60	28	52	151	147	108
Zwentendorf	169	141	126	368	197	353
total	1974	1207	1446	5322	3112	3725

Energy consumption

	heating oil	wood	wood chips, pellets	coal, coke, briquets	electricity	natural gas	alternative systems (solar, geothermal, etc.)	others	teleheating	not centrally heated
Atzenbrugg	437	141	13	57	50	27	23	0	0	224
Judenu-Baumgarten	156	91	6	27	24	324	7	0	0	145
Königstetten	137	85	3	22	33	316	4	0	0	206
Langenrohr	182	93	5	23	33	231	10	1	0	148
Michelhausen	471	127	28	49	37	21	12	1	0	228
Muckendorf-Wipfing	79	37	1	6	13	236	5	0	0	337
Sieghartskirchen	767	399	28	39	90	901	26	3	5	658
Sitzenberg-Reidling	319	130	9	71	32	30	9	0	0	196
Tulbing	433	116	10	13	27	485	15	3	0	239
Tulln	523	276	48	78	94	2392	22	0	56	1372
Würmla	212	113	21	17	19	25	3	0	0	136
Zwentendorf	310	151	19	54	98	18	14	12	253	425
total	4026	1759	191	456	550	5006	150	20	314	4314

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