

WP2. Urban and regional planning and infrastructure for LETS

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Summary	
<p>The objective of this work package (WP2) is to analyse urban and regional planning and changes in infrastructure as a mean for reducing CO₂ emissions; the knowledge gained will be used to create tools, instruments and recommendations that supports the implementation of LETS and more sustainable planning. Three research areas will be approached: (1) <i>Regional and local planning - Transport, mobility and accessibility</i> - The focus will be on analysing different factors in the built-up environment and the transport system which promote accessibility to functions and activities while keeping a low mobility. (2) <i>Planning Tools for reducing energy demand in the Built Environment</i> - The objective here is to analyze potential development and combinations of legal instruments and complementary local and regional tools targeting energy use in the built environment. (3) <i>Industrial and regional development - structural change and climate constraints</i>- The focus is on how radical changes may affect competitiveness of various industries, structural change and regional development: possible corporate adjustments and regional policy change will be evaluated. <i>The research approach of WP2 will also aim at finding efficient methods for researcher-practitioner dialogue to improve and engage local actor participation in the process mitigating and adapting of climate change.</i></p>	
Sammanfattning	
<p>I WP2 analyserar vi urban och regional planering samt förändringar i infrastruktur som potentiella medel för att minska CO₂utsläppen. Syftet är att bidra med ny kunskap till grund för nya styrmedel, verktyg och rekommendationer som stödjer genomförandet av HET och en mer hållbar samhällsplanering. I projektet studeras tre frågeställningar: (1) <i>Regional and urban planering för transport mobilitet och tillgänglighet</i> med fokus på analys av olika parametrar, i den byggda miljön såväl som i transportsystemet, som minskar transportvolymen och behovet av resande . (2) <i>Verktyg och styrmedel för planering av den byggda miljön som minskar energianvändningen</i> med målet att analysera och utveckla verktyg, incitament och regleringar (och kombinationer av dessa) för effektivare energianvändning. (3) <i>Industriell och regional utveckling: strukturförändringar och klimatpåverkan</i> med fokus på hur radikala minskningar av CO₂-utsläppen kan påverka konkurrenskraften för olika ekonomiska verksamheter och regional utveckling; i projektet utvärderas därför hur nya mål och metoder inom regionalpolitik och planering kan bidra till minskade utsläpp samtidigt som företagets konkurrensförmåga i olika regioner bevaras. Forskningen inom WP2 bedrivs i nära samverkan med kommun och region, och en viktig ansats är att finna effektiva metoder för samverkan mellan forskare och praktiker i klimatarbetet.</p>	

Project idea and objectives

The objective of this work package (WP2) is

- (1) to analyse urban and regional planning and changes in infrastructure as a mean for reducing CO₂ emissions related to transport and the built environment, and
- (2) to create tools, instruments and recommendations that supports the implementation of more sustainable planning.

Today, passenger transport, transport of goods and energy use related to the built environment are key sources of CO₂ emissions. At the same time energy use in these areas very much depends on the structure and infrastructure of society. To reduce CO₂ emissions, structural and infrastructural changes are needed. As stated in WP1: Planning, in a system of multi-level governance and partnership with a range of different actors, is considered a key element for green welfare state models. Thus, local and regional strategies, action and engagement to combat climate change and reduce energy demand, including planning tools appropriate for the purpose, would be necessary options for the future.

Knowledge related to effectiveness and efficiency of planning is however underdeveloped. In this project, our aim is to analyze and suggest how planning may be used and developed for systematic and efficient implementation of ambitious climate policy objectives (such as the 2 °C target), with due considerations taken to conflicting interests and objectives. Our focus is on possible changes and development of infrastructure with regard to the built environment and transports. We will analyze a selection of critical cases covering different sectors, different actors and different types of schemes. The analysis will include different types of initiatives in terms of alternative design and/or localisation options, likeliness of different alternatives to be applied, effectiveness of different alternatives in terms of emissions reductions, advantages and disadvantages of alternative tools and how different initiatives complement or conflict with each other. Further, the analysis will include different aspects of tools for planning such as consultations with stakeholders and facilitating voluntary action but also regulation and economic analysis and incentives.

Practical relevance, outcomes and results

Policy relevant outcome and results

New knowledge concerning options for urban and regional planning and infrastructure with regard to transports and the built environment, based on theoretical analysis, data-bases and review of experienced cases, will be highly relevant as such and to guide further initiatives to combat climate change. Our approach includes the active involvement of practitioners and planners. We aim at finding efficient methods for researcher-practitioner dialogue. We will partly base this work on a platform developed within the project Sustainable Urban development in the Region of Skåne; including participants from Lund University and the cities of Malmö and Lund. The project thus includes development of processes to improve and engage local actor participation in the process mitigating and adapting of climate change. We intend to develop new strategies for 1) more effective implementation of *existing* knowledge and technical solutions, and 2) new policies for promoting *further development* of knowledge and technical improvement, and its implementation, concerning CO₂ reduction with regard to the built environment and transports in cities and regions.

Communication activities and Target groups

The main target groups for WP2 are local and regional planners, relevant industry representatives and relevant agencies at national, regional and local level. The work and the outcomes of WP2 will also be communicated with the international research community to contribute to

knowledge on sustainable planning through publications in international journals and at research conferences. The results will be communicated through reports and a series of workshops with key stakeholders (see table below). The workshops will be both internal and external; i.e. the research will be reviewed and discussed with research partners in other WPs as well as with practitioners such as local and regional planners. The external workshops will cover different topics over time, included or related to the work in WP2. These workshops will serve as a discussion forum on urban and regional planning and changes in infrastructure, and methods for researcher-practitioner dialogue will be practiced.

Deliverables		
D2.1	Jan 2009	Stakeholder workshop on the role of planning for LETS
D2.2	June 2009	Workshop on Transport, Mobility and Accessibility
D2.3	Aug 2009	Publication: Regional analysis of mobility and accessibility in Skåne
D2.4	Jan 2010	First workshop on the Built Environment and Energy demand
D2.5	Mar 2010	Publication: Planning tools and initiatives for improved energy performance
D2.6	June 2010	Workshop on Industrial and regional development
D2.7	Aug 2010	Publication: Regional policy and a future low-carbon economy
D2.8	Jan 2011	Second workshop on the Built Environment and Energy demand
D2.9	Mar 2011	Publication: Planning tools and regulations for improved energy performance
D2.10	Jan 2012	Evaluation of the researcher-practitioner dialogue (workshop)
D2.11	June 2012	Report on methods for a researcher-practitioner dialogue
D2.12	June 2012	Final report: Tools, instruments and recommendations for urban and regional planning and changes in infrastructure as a mean for reducing CO ₂ emissions.
D2.13	Sep 2012	Final Seminar on planning tools and instruments for LETS

How the project relate to the programme objectives and other projects

CO₂ emissions related to transport and the built environment needs to be reduced radically, which, in turn, requires fundamental changes and shifts in governance. A central level of governance relates to changes in infrastructure and tools for urban and regional planning, as described in this work package. Research of governance at different levels (WP1 and WP2) relate closely to the storylines elaborated in this programme (WP0) and the societal challenges and dilemmas associated with such transitions. Research on changes in technology, industry and markets (WP3) as well as on individual behaviour and consumer-oriented voluntary instruments (WP4) will contribute to the analysis of Urban and Regional Infrastructure and Planning (WP2). In particular, the research on mobility management in WP4 links clearly to issues about transport planning, since the Mobility Management and Planning and Infrastructure represent two sides of a necessary development towards more sustainable transport systems in urban areas.

Review of the research field (Theory)

As stated above, the use of urban and regional planning to mitigating climate change and reduce energy demand has been limited, and knowledge related to effectiveness and efficiency of planning is underdeveloped. Many local authorities report that they lack up-to-date programs and strategies for meeting the environmental objective of “A good built environment“ (EOC, 2007). This objective also covers targets for reduction of CO₂ emissions through improved energy efficiency, i.e. by implementing the so-called EET strategy. In WP2 we will emphasize three approaches to urban and regional planning for such climate change mitigation regarding Transport, Energy demand and Industrial development. Reviews of the research fields for each one of these are presented below integrated with the DoW.

Description of work: Implementation, Research Approach and Methodology

(i) Regional and local planning - Transport, mobility and accessibility

In the long term the structure and location of the built-up environment will have significant influence on the total traffic volume and its distribution among different modes, such as cars, pedestrians, cycles and public transport, and subsequently also on energy consumption, traffic safety and the environment. Several studies have shown significant links between population density and transport volumes and fuel consumption per capita (e.g. Newman and Kenworthy, 1989, Naess, 1995, Schwanen et al, 2001). Functional integration, i.e., dwellings, workplaces, services and the like combined in one area, does not appear to unequivocally lead to less traffic. The location of workplaces in outer areas may lead to a higher proportion of cars if access to parking and level of service for cars are good, and this applies even if the location is near bus and train terminals (OECD 2002). Nonetheless, Naess (1995) found that accessibility to good public transport in the vicinity of the workplace is significant for the choice of mode of transport.

This task will contribute to a better understanding of the effects of localization of residential areas, work places, service and leisure activities within a region on transport volumes, and to what extent measures in terms of accessibility to public transport and bicycle facilities affect modal choice and transport volumes and energy use. The aim is to analyse which factors in the linkage between the built environment and the transport system promote accessibility to functions and activities while limiting mobility (i.e. vehicle mileage). The research will be based on a literature review and workshops with physical planners and representatives for the public transport authorities in the Skåne region. The relation between travel behaviour on the one hand, and factors characterizing the built environment and the transport system from the regional and local perspective on the other, will be analysed through the use of data from a travel behaviour survey carried out for Skåne in 2007. The purpose is to investigate the links between a) travel behaviour in terms of trip frequency, trip purpose, trip lengths and mode choice, b) the accessibility to service and leisure activities in the area, c) the commuting distance, d) the quality of public transport and bicycle/walking facilities in connection to the dwelling and work place e) socioeconomic variables in built-up areas of different sizes and with different population densities. The final step is to evaluate present planning instruments with regard to the need for planning procedures that support accessibility without increasing traffic, and to discuss possible ways forward.

(ii) Planning Tools for reducing energy demand in the Built Environment

The built environment relates to more than 35% of the total energy use in Sweden. To reduce energy demand, different types of policy instruments have been developed and applied, such as building codes, subsidies, information programs etc. These instruments are however not sufficient to reduce energy demand in the built environment. In recent years, interest in alternative and additional tools has increased. In this task we focus on alternative tools related to planning; as far, planning tools has not been a powerful driver or a tool for reduced energy demand in the built environment. In 2008, Boverket is analyzing to what extent legal instruments for planning can be used to reduce energy demand (Boverket, 2008). We will follow up on this work, which is to be finalized in December 2008, and ask how legal instruments for planning could be reformed to support the reduction of CO₂ emissions (see also SOU, 2005). Moreover, several municipalities are developing programs with requirements, additional to the legal requirements (e.g. Stockholm's Miljöbyggprogram and MiljöbyggprogramSyd), and are involved in initiatives, such as the Bygga-Bo dialogue and classification systems.

In this task we will analyze to what extent such initiatives will reduce energy demand and to what extent such initiatives overlap, complement or support each other. Moreover, we will analyze and discuss the combination of planning and complementing local and regional tools covering also conflicting objectives of different initiatives related to energy efficiency in the built environment. The consequences related to the findings will be evaluated with regard to potential emissions reductions but also with regard to democratic, social and economic aspects. The research will be based on literature reviews and dialogues with relevant stakeholders and practitioners.

(iii) Industrial and regional development - structural change and climate constraints

The evolution of new General Purpose Technologies during the last few decades has strongly effected growth and transformation among industries and completely reshaped the economic landscape. Grand technology shifts have been shown not to be neutral when it comes to industrial and regional restructuring. On the contrary, winners and losers among industries and regions will appear and disappear over long time in ways that just recently has been revealed and understood by economic science. A theoretically well underpinned view of what probably lies before us economically in the next two decades can also be discerned. Research in this field is therefore one of many points of departure to understand how other radical changes like reaching the CO₂ target may affect competitiveness of various industries, structural change and regional development. This project will focus on economic and regional outcomes from cutting GHG substantially, especially from transportation within the business sector.

In this task we will (1) analyze to what extent technology shift and structural change have affected volumes and importance of transportation and transport costs within the Swedish economy; and (2) analyze changes in transportation volumes and costs on industry level: the relations between competitiveness and transport costs; how vital are industries sensitive to transport costs for the Swedish economy? The landscape of transport costs does not all together correspond to the landscape of value added. Which regions are most vulnerable to changes in transport costs?; (3) Analyze political, technical, economical and geographical possibilities for the following adjustments within the business sector, provided that the sector must take full responsibility for reducing CO₂ emissions (e.g. increased train transport load, intensified local production, changed geographical strategies for supply-chains and outsourcing, changes in interpersonal business communication, IT communication); (4) Analyze the implications of a CO₂ neutral growth when it comes to regional policy in Sweden and the EU. Will market adjustments as those mentioned be enough to substantially reduce transports and emissions without losing comparative advantages, or will it be necessary also to choose growth centres for various parts of the economy; sites where the scale of production and transportation can be optimized for energy-effective transportation? Is it possible to point out which regions will be winners and losers as an outcome of such a process? What conflicts of regional policies can be foreseen and adjusted to?

(iv) Synthesis on planning instrument and tools

An important task is to compile and synthesise the lessons learned from the seminars and researcher-practitioner interaction. Based on the three research areas approached in this work package (WP2), as well as by others (e.g. WP4), knowledge will be gained that can be used to develop tools, instruments and recommendations that supports the implementation of more sustainable planning and the transitions towards LETS. Moreover, the research will result in suggestions of methods for a useful researcher-practitioner dialogue that can improve and engage the participation of local actors in the process mitigating and adapting of climate change.

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