

Regional Carbon Footprint

A Greenhouse Gas Accounting Tool for Regional and Municipal Climate Change Management

Jens Heider¹, Daniel Tasche¹, Jörg Lässig¹, Markus Will²

¹University of Applied Sciences Zittau/Goerlitz, Department of Computer Science, Görlitz, Germany

²University of Applied Sciences Zittau/Goerlitz, Faculty of Mathematics and Natural Sciences, Zittau, Germany

Introduction

- **complex models** on anthropogenic climate change **based on scientific expertise** available
 - consensual and consistent **methodological standards** on accounting of greenhouse gases **are needed**
 - no common methodology in practice
 - **existing tools fail** to balance scientific adequacy and pragmatic usability
- ⇒ **Regional Carbon Footprint** as basic instrument for local/regional climate and energy concepts

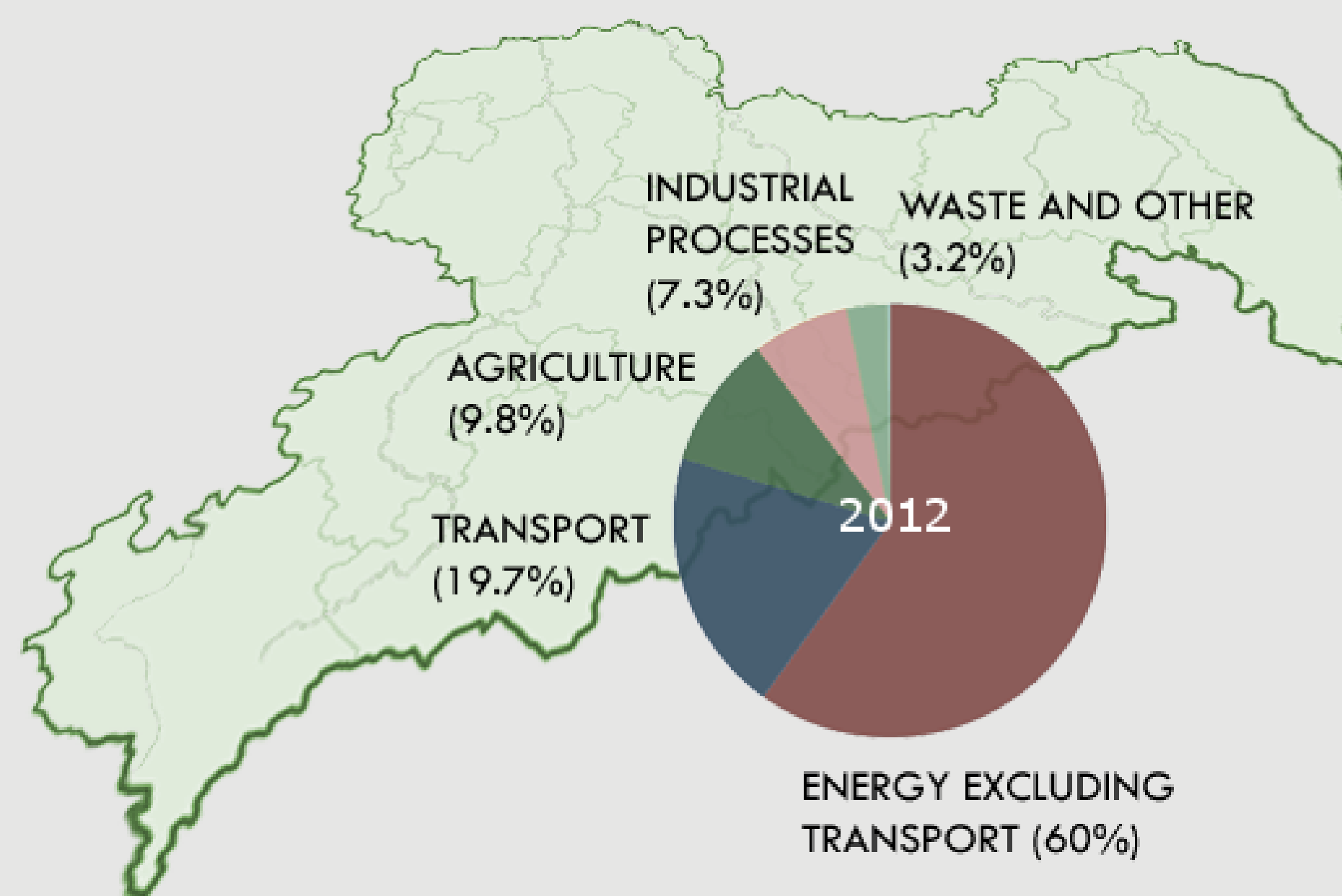
Goals

- development of a **sound methodology** for greenhouse gas accounting to support **regional and local decision making**
- **software tool** for:
 - calculation of regional greenhouse gas inventories
 - data management
 - reporting
- scenario analysis, climate action planning and remote monitoring

Regional Carbon Footprint

Sectors Considered

- **energy** (electricity, renewable energies, district heat, combined heat and power)
- **transport** (passenger, cargo, forestry and agriculture)
- **industry** (by branch)
- **agriculture** (fermentation, fertilizer, land usage)
- **aggregated sources** (liming, mineral fertilizing)
- **waste** (biologic, septic pit, municipal sewage)
- **atmospheric deposition** (reduce greenhouse gas potential)



Report

- regional surveys
- analysis of the current state
- descriptive statistics
- action alternatives
- structured by sector
- trend exposure with historical values
- monitoring of mitigation measures

Early Prototype

Fig. 1. Screenshot: input of required data of the appropriate municipality

- prototype **web application**
- currently developed by **Enterprise Application Development Group**, faculty of Electrical Engineering and Computer Sciences
- generates **online-/pdf-report**

Fig. 2. Screenshot: administration of background values, needed for calculation

Climate Action Planning

Master Thesis: "Design of a Modeling and Assistance Tool for Scenario Analysis and Climate Action Planning"

- development of an interactive assistance system to support climate action planning workshops
- influencing factor definition
- dynamic scenario design for climate change mitigation
- course of action derivation & impact estimation
- visualization & real-time action effect representation
- dynamic report generation

Smart Home Monitoring

Master Thesis: "Sustainable Sensing – Design of a Remote Monitoring Solution for Smart Homes"

- development of a cloud based solution for smart home monitoring of energy relevant data
- interactive mapping to real buildings & components
- integration of real-time sensing
- rule-based action system
- real-time comparison of current state with expected values
- dynamic report generation