

## Chapter VI

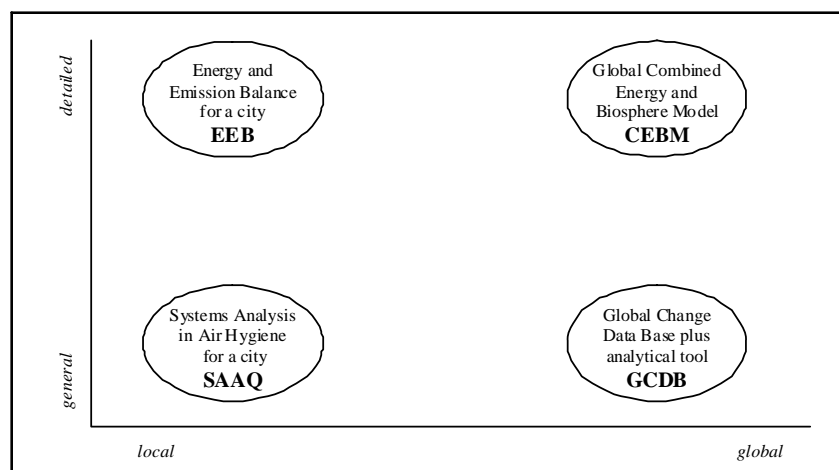
# A Structured Basket of Models for Global Change

Gilbert Ahamer  
Federal Environment Agency, Austria

*Several conceptual and modelling frameworks are presented in such a level of detail that it is possible to discuss their usability as tools for the envisaged target groups in: “public administration” and “representatives of industry.”*

*The main four models are brought into a structure as a function of their level of detail versus coverage regarding subject matter and geography (Figure 1).*

Figure 1: Basic structure of this contribution: four modelling frameworks



*The objective of this chapter is to give an overview on contemporary research and development activities and results in the field of modelling frameworks supporting to cope with Climate Change, which are mainly energy or air emission models and assessment tools. Their implementation as an IT tool is described as well as typical results.*

*The different functions of Environmental Information Systems (EnvIS) are presented by these case studies:*

- *EnvIS Model Global Change: The Combined Energy and Biosphere Model (CEBM)*
- *EnvIS Practically Support Climate Protection: The Energy & Emission Balance for Cities (EEB)*
- *EnvIS as Systems Analysis for Air Quality in a City: A Semi-Quantitative Modelling Framework (SAAQ)*
- *EnvIS Identify Impacts Driving Global Change: The Global Change Data Base (GCDB)*
- *EnvIS Harmonise Economic with Environmental data: (NAMEA)*
- *EnvIS Show the Status Quo: National Emission Reporting Systems (NERS)*
- *EnvIS Provide Planning Details: Energy Technology Databases (ETDB)*

*It is stated that these models can fruitfully be combined with each other along the procedure of planning and implementing climate protection measures.*

## INTRODUCTION

### General perspective of this contribution

This contribution presents four modelling frameworks that can be structured along their level of detail, their geographic coverage and their degree of quantification that are typical for each of these environmental information systems. All four describe a subset of the various aspects affecting global change:

- Emissions
- Energy
- Land Use and Biomass
- Economic and Social Parameters.

The specific objective of this chapter is to present, discuss and evaluate the usability of the model concepts and their present stage of IT implementation for the target of inter-subjective assessment of the driving forces, mechanisms and effects of global change for the needs of practical planning on a local, national and/or global level. For each presented model, portfolios are displayed that briefly describe their positions and abilities.

Target groups are public administrations and bodies representing economy and industry who are motivated to break down the concept of sustainability to practical action options while maintaining the larger scope, as is proposed by the traditions of technology assessment and systems thinking.

34 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/structured-basket-models-global-change/18530](http://www.igi-global.com/chapter/structured-basket-models-global-change/18530)

## Related Content

---

### Quantifying Urban Sprawl with Spatial Autocorrelation Techniques using Multi-Temporal Satellite Data

Gabriele Nolè, Rosa Lasaponara, Antonio Lanorteand Beniamino Murgante (2014). *International Journal of Agricultural and Environmental Information Systems* (pp. 19-37).

[www.irma-international.org/article/quantifying-urban-sprawl-with-spatial-autocorrelation-techniques-using-multi-temporal-satellite-data/114684](http://www.irma-international.org/article/quantifying-urban-sprawl-with-spatial-autocorrelation-techniques-using-multi-temporal-satellite-data/114684)

### Intelligent Control of the Energy Generation Systems

Nicu Bizon (2010). *Intelligent Information Systems and Knowledge Management for Energy: Applications for Decision Support, Usage, and Environmental Protection* (pp. 40-96).

[www.irma-international.org/chapter/intelligent-control-energy-generation-systems/36963](http://www.irma-international.org/chapter/intelligent-control-energy-generation-systems/36963)

### Sustainable Business Value

Daniel Younessi (2011). *Handbook of Research on Green ICT: Technology, Business and Social Perspectives* (pp. 98-115).

[www.irma-international.org/chapter/sustainable-business-value/48422](http://www.irma-international.org/chapter/sustainable-business-value/48422)

### Indicators, Modelling, and Visualization of Islands

(2019). *Transitioning Island Nations Into Sustainable Energy Hubs: Emerging Research and Opportunities* (pp. 132-158).

[www.irma-international.org/chapter/indicators-modelling-and-visualization-of-islands/210364](http://www.irma-international.org/chapter/indicators-modelling-and-visualization-of-islands/210364)

### Smart Farming: An Approach for Disease Detection Implementing IoT and Image Processing

Hui Pang, Zheng Zheng, Tongmiao Zhenand Ashutosh Sharma (2021). *International Journal of Agricultural and Environmental Information Systems* (pp. 55-67).

[www.irma-international.org/article/smart-farming/273710](http://www.irma-international.org/article/smart-farming/273710)