

## Cross-Impact Balance Analysis - Guideline no. 2

### Bibliography<sup>1</sup>

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This bibliography lists publicly accessible documents dealing with methodological aspects of the CIB method (section A) or describing CIB applications in various research fields (section B). The bibliography is based on personal communications about CIB related publications, regularly conducted internet searches, and own research. Although we took considerable effort to identify as much publications as possible, this bibliography may be incomplete. Hints about additional literature are welcome.

#### A. Methodological publications

Lloyd E.A., Schweizer V.J. (2013): Objectivity and a comparison of methodological scenario approaches for climate change research. *Synthese*.

Compares Intuitive Logics (a widely used traditional scenario method) and CIB with respect to the epistemic qualities of the scenario process and its results.

Weimer-Jehle W., Prehofer S., Vögele S. (2013): Kontextszenarien - Ein Konzept zur Behandlung von Kontextunsicherheit und Kontextkomplexität bei der Entwicklung von Energieszenarien [Context scenarios - a concept for addressing context uncertainty and context complexity in energy scenarios, in German]. *TATuP 22(2)*, 27–36

Based on Weimer-Jehle, Kosow (2011) this paper formulates the concept of CIB-based context scenarios in energy scenario analysis in detail, and connects the approach with the research conducted by Schweizer, Kriegler and O'Neill in climate scenario research (see below in section B).

Kemp-Benedict E. (2012): Telling better stories - Strengthening the story in story and simulation. *Environ. Res. Lett.* 7 041004

This paper is a Perspective for the article of Schweizer and Kriegler (2012) (see below in section B). It discusses the possible benefits of CIB in constructing socioeconomic scenarios in climate change research.

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<sup>1</sup> Information on CIB and handouts on how to apply the method can be found at [www.cross-impact.de](http://www.cross-impact.de)

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- Kosow, H. (2011): Consistent context scenarios: a new approach to 'story and simulation'. In: Proceedings of the 4th International Seville Conference on Future-Oriented Technology Analysis (FTA), Seville (Spain), 12.-13.05. 2011
- Weimer-Jehle W., Kosow H. (2011): Gesellschaftliche Kontextszenarien als Ausgangspunkt für modellgestützte Energieszenarien [Social Context Scenarios as a Starting Point for Model-Based Energy Scenarios, in German]. In: Dieckhoff C. et al. (Eds.): Energieszenarien - Konstruktion, Bewertung und Wirkung. KIT Scientific Publishing, Karlsruhe
- Weimer-Jehle W. (2009): Properties of Cross-Impact Balance Analysis. arXiv:0912.5352v1 [physics.soc-ph].
- Weimer-Jehle W. (2009): Szenarienentwicklung mit der Cross-Impact-Bilanzanalyse [Generating Scenarios Using Cross-Impact Balance Analysis, in German]. In: Gausemeier J. (Ed.): Vorausschau und Technologieplanung. HNI-Verlagsschriftenreihe Vol. 265, Paderborn, 435-454.
- Weimer-Jehle W. (2008): Cross-Impact Balances - Applying pair interaction systems and multi-value Kauffman nets to multidisciplinary systems analysis. *Physica A*, 387:14, 3689-3700.
- Weimer-Jehle W. (2006): Cross-Impact Balances: A System-Theoretical Approach to Cross-Impact Analysis. *Technological Forecasting and Social Change*, 73:4, 334-361.
- Proposes CIB as a scenario construction method within the SAS-concept (story-and-simulation concept) in environmental scenario analysis.
- The paper proposes the application of CIB-based "context" scenarios to derive consistent framework assumptions for model-based energy scenario analysis.
- A mathematical oriented contribution to CIB research. It investigates the mathematical properties of CIB matrices.
- Compares CIB and Consistency Matrix, a traditional scenario method which has inspired the CIB method development.
- In this paper CIB is seen as an algorithm analyzing dynamic networks and some correspondences to complexity research are described.
- This is CIB's methodological basic paper. It explains the motifs for proposing a new method of scenario construction, describes the technical process of doing CIB, and analyzes the connections of CIB to the concept of balance of forces in dynamic systems research.

## **B. Reported CIB applications**

in the fields of climate change, education, energy, health, innovation, societal change, sustainability, waste and water.

### **Climate change**

Schweizer V.J., O'Neill B.C. (2014) Systematic construction of global socioeconomic pathways using internally consistent element combinations. *Climatic Change* 122, 431–445

Wachsmuth, J. (2013): Entwicklung dreier Szenarien für mögliche Rahmenbedingungen in der Metropolregion Bremen-Oldenburg im Nordwesten im Jahr 2050 [Developing three scenarios for possible framework conditions in the Bremen/Oldenburg metropolitan region, in German]. Working report no. 22 of the project Nordwest2050 ([www.nordwest2050.de](http://www.nordwest2050.de)).

Schweizer, V.J.; Kriegler, E. (2012): Improving environmental change research with systematic techniques for qualitative scenarios. *Environ. Res. Lett.* 7

### **Education**

Vergara-Schmalbach J.C., Fontalvo Herrera T., Morelos Gómez J. (2012): Aplicación de la Planeación por Escenarios en Unidades Académicas: Caso Programa de Administración Industrial [Application of scenario planning in academic units: Industrial Management Program Case, in Spanish]. *Escenarios* 10(1), 40-48.

### **Energy**

Hansen P., Pannaye C., Vögele S. (2013): The Future(s) of the Energy Consumption of Private Households in Germany - A Multilevel Cross-Impact Analysis. Research Center Jülich, STE Research Report 4/2013.

Jenssen T., Weimer-Jehle W. (2012): Mehr als die Summe der einzelnen Teile - Konsistente Szenarien des Wärmekonsums als Reflexionsrahmen für Politik und Wissenschaft [More than the Sum of Its Parts. Consistent Scenarios for the Consumption of Heat Energy as a Common Reference Point for Policy and Science, in German], *GAIA* 21/4, 290–299

Vögele S. (2012): Entwicklung der Rahmenbedingungen für neue Energietechnologien [Development of framework assumptions for new energy technologies, in German]. Research Center Jülich, STE Research Report 4/2012.

Jenssen T., Weimer-Jehle W. (2012): Möglichkeitsräume des zukünftigen Konsums von Wärme [Future heat consumption - a contingency analysis, in German]. In: Gallego Carrera D., Renn O., Wassermann S., Weimer-Jehle W. (Eds.): Nachhaltige Nutzung von Wärmeenergie (Sustainable Heat Consumption). Springer-Vieweg, Heidelberg, Wiesbaden.

Aretz, A., Weimer-Jehle, W. (2004): Cross Impact Methode [Cross-impact method, in German], in: Der Beitrag der deutschen Stromwirtschaft zum europäischen Klimaschutz. Forum für Energie-

modelle und energiewirtschaftliche Systemanalyse, eds., LIT-Verlag, Münster, Germany.

Förster, G., Weimer-Jehle, W. (2004): Cross-Impact Methode [Cross-Impact Method, in German]. In: Energiemodelle zum Klimaschutz in liberalisierten Energiemärkten - Die Rolle erneuerbarer Energieträger. Forum für Energiemodelle und energiewirtschaftliche Systemanalyse, eds., LIT-Verlag, Münster, Germany.

Förster G., Weimer-Jehle W. (2003): Szenarien einer liberalisierten Stromversorgung [Scenarios of a liberalized electricity market, in German]. Technikfolgenabschätzung in Theorie und Praxis, 12:(1).

Förster, G. (2002): Szenarien einer liberalisierten Stromversorgung [Scenarios for a liberalized electricity market, in German]. Center for Technology Assessment, Stuttgart, Germany.

## **Health**

Aschenbrücker, A., Löscher, M., Troppens, S. (2013), Scenario-based supply chain risk management to avoid drug shortages caused by external threats in the pharmaceutical supply chain, 20thEurOMA Conference, Dublin June 7-12, 2013.

Aschenbrücker, A., Löscher, M. (2013), Szenario-gestützte Identifikation von externer Bedrohungspotenzialen in der Medikamentenversorgungskette, IPRI-Praxis No. 2, Stuttgart. ([www.ipri-institute.com](http://www.ipri-institute.com))

Weimer-Jehle W., Deuschle J., Rehaag R. (2012): Familial and societal causes of juvenile obesity - a qualitative model on obesity development and prevention in socially disadvantaged children and adolescents. Journal of Public Health, 20(2), 111-124.

## **Innovation**

Weimer-Jehle W., Wassermann S., Fuchs G. (2010): Erstellung von Energie- und Innovations-Szenarien mit der Cross-Impact-Bilanzanalyse: Internationalisierung von Innovationsstrategien im Bereich der Kohlekraftwerkstechnologie [Generating Energy- and Innovation-Scenarios using Cross-Impact Balance Analysis - Internationalization of Innovation Strategies for Coal Power Plant Technology]. 11. Symposium Energieinnovation, TU Graz, 10.-12.02.2010.

Fuchs G., Fahl U., Pyka A., Staber U. Vögele S., Weimer-Jehle W. (2008): Generating Innovation Scenarios using the Cross-Impact Methodology. Department of Economics, University of Bremen, Discussion-Papers Series No. 007-2008.

Weimer-Jehle W., Fuchs G. (2007): Generierung von Innovationsszenarien mit der Cross-Impact Methode [Generating innovation scenarios using the cross-impact method, in German], in: Innovation und moderne Energietechnik. Forum für Energiemodelle und energiewirtschaftliche Systemanalyse, eds., LIT-Verlag, Münster, Germany.

## **Societal change**

Abbassi P., Kaul M., Mohan V., Shen Y., Winkelmann Z. (2013): Securing the net - Global

governance in the digital domain. Global Governance 2022 ([www.gg2022.net](http://www.gg2022.net)).

Weimer-Jehle W., Wassermann S., Kosow H. (2011): Konsistente Rahmendaten für Modellierungen und Szenariobildung im Umweltbundesamt [Consistent framework assumptions informing model- and scenario-analysis at the German Federal Environment Agency, in German]. Expert's Report for the German Federal Environment Agency (UBA), UBA-Texte 20/2011, Dessau-Roßlau.

Cabrera Méndez A.A., Puig López G., Valdez Alejandro F.J. (2010): Análisis al plan national de desarrollo - una visión prospectiva [Analysis of the national development plan: a prospective vision, in Spanish]. XV Congreso internacional de contaduría, administración e informática, México.

### **Sustainability (general)**

Renn O., Deuschle J., Jäger A., Weimer-Jehle W. (2009): A normative-functional concept of sustainability and its indicators. *International Journal of Global Environmental Issues*, 9:4, 291-317.

Renn O., Deuschle J., Jäger A., Weimer-Jehle W. (2007): Leitbild Nachhaltigkeit - Eine normativ-funktionale Konzeption und ihre Umsetzung [Model Sustainability - A normative-functional concept and its implementation, in German]. VS-Verlag, Wiesbaden, Germany.

### **Waste**

Meylan G., Seidl R., Spoerri A. (2013): Transitions of municipal solid waste management. Part I: Scenarios of Swiss waste glass-packaging disposal. *Resources, Conservation and Recycling* 74, 8-19.

Saner D., Blumer Y.B., Lang D.J., Koehler A. (2011): Scenarios for the implementation of EU waste legislation at national level and their consequences for emissions from municipal waste incineration. *Resources, Conservation and Recycling*, 57, 67-77.

### **Water**

Uraiwong P. (2013): Failure analysis of malfunction water resources project in the Northeastern Thailand - Integrated mental models and project life cycle approach. Kochi University of Technology, Japan.

Kosow H., León C., Schütze M. (2013): Escenarios para el futuro - Lima y Callao 2040. Escenarios CIB, storylines & simulacin LiWatool [Scenarios for the future of Lima and Callao 2040. CIB scenarios, storylines and LiWatool simulations, in Spanish]. Scenario brochure of the Liwa project ([www.lima-water.de](http://www.lima-water.de)).

John S. (2009): Bewertungen der Auswirkungen des demographischen Wandels auf die Abwasserbetriebe Bautzen mit Hilfe der Szenarioanalyse [Using Scenario Analysis for Assessing the Impacts of Demographic Change on the Wastewater Management Authorities in Bautzen, in German]. *Dresdner Beiträge zur Lehre der betrieblichen Umweltökonomie* 34/09, Universität Dresden.

The series “Cross-impact balance analysis guidelines” provides information and assistance for the implementation of scenario and systems analyses using the CIB method. In addition to a description of the basics and information on the method’s background the series also includes instructions on its application, procedural descriptions and sample analyses. Publications to date:

No.	Title	Requirements
1	Introduction to qualitative systems and scenario analyses using cross impact balance analysis	none
2	Bibliography	no. 1
3*	<i>Sample instructions for experts on issuing cross-impact judgements</i>	<i>no. 1</i>
4	Key figures used in the analysis of CIB scenarios	no. 1

\* *in preparation*