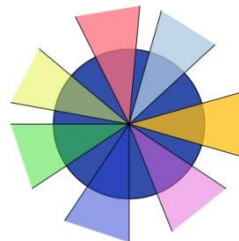


**Book of Abstracts of State of the Art Workshop LISBON  
2010 Operational Research**

**EUROMSC / EURO MCDA / EUROPT / EURO ORD /  
Ethics and OR**

**Volume 22**

Dorien DeTombe, Cathal Brugha, Gerhard-Wilhelm Weber,  
Fred Wenzel (Eds.)



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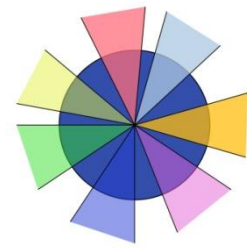
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**Satellite event  
State of the Art Workshop LISBON**



**Sunday, July 11th, 10 a.m. till 2 p.m. in Lisbon 2010**

**a workshop related to EURO XXIV /**

**a cooperation of the Euro Working Groups of**

**EWG Methodology for complex societal problems**

**Euro MCDA**

**EWG EUROPT, EURO Continuous Optimization**

**OR for development**

**EURO Working Group on Ethics and OR**

**EUROMSC / EURO MCDA / EUROPT / EURO ORD / Ethics and OR**

organized by

Prof. dr. Dorien DeTombe [EWG Methodology for complex societal problems](#)  
[OR for development](#)

Prof. dr. Cathal Brugha <http://analyticsinstitute.org> Euro MCDA

Prof. dr. Gerhard–Wilhelm Weber [EWG EUROPT, EURO Continuous Optimization](#)  
[OR for development](#)

Prof. dr. Fred Wenstøp [EURO Working Group on Ethics and OR](#)

Several presenters give an overview of their field, overview of recent research and discussion about future research question in their field.

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**Program Satellite event**  
**State of the Art Workshop LISBON**

Chair Prof. Dr. Cathal Brugha

Dorien DeTombe

Opening Statement On Cooperation Of Research Between The Euro Working Groups (Video)

Cathal Brugha

Foundation Of Nomology

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Evelina Trutnevyte

Envisioning The Future Energy System

## Foundation Of Nomology \*

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This paper introduces for the first time the foundation of Nomology, the science of the laws of the mind. It addresses one of the most complex questions we face, how do we develop the systems within which we think and live?

This is a meta-system problem, the solution to which is a system which itself contains several inter-locking systems. One of these challenges is how we Adjust Ourselves, and requires that any changes must be Consistent, Compelling, Compatible and Compelling.

Another challenge is how we Adjust our models of the World, and involves going through a process of Framing, Naming, Explaining and Re-Framing.

A third challenge is how we are Convinced, which involves Rules, Case experience, and that it "Feel Right". Adjust our models of the World, and involves going through a process of Framing, Naming, Explaining and Re-Framing.

In order to explain Religious-Political Conflict Resolution, in terms of an Adapting system, aspects of which include Body, Mind, Soul and Spirit. It suggests that people of all religions and none will have to do a lot of "soul-searching" before progress can be made to reduce the causes of religious-political conflict. The paper endorses the direction of the discussion about the separation of church and state that took a path from Hegel to Rawls, to Habermas, and uses the meta-framework to propose where the discussion should go in the future. It suggests that this will involve cooperative inter-religious examination and challenging of religious texts.

Keywords: systems methodology; nomology; decision science; philosophy.

## On Ellipsoidal Collaborative Games

**Gerhard-Wilhelm Weber, Z. Alparslan Gök And M. Branzei**

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This paper deals with the ellipsoidal core for cooperative ellipsoidal games, a class of transferable utility games where the worth of each coalition is an ellipsoid instead of a real number. Ellipsoids are a suitable data structure whenever data are affected by uncertainty and there are some correlations between the items under consideration. In the real world, noise in observation and experimental design, incomplete information, vagueness in preference structures and decision making are common sources of uncertainty, besides technological and market uncertainty. It is often easy to forecast ranges of values for uncertain data. Nevertheless, the representation of data uncertainty in terms of ellipsoids is more suitable than the error intervals of single variables since ellipsoids are directly related to covariance matrices. The ellipsoidal core has been recently introduced to answer the important question “How to deal with reward/cost sharing problems under ellipsoidal uncertainty?” Here, we study properties of this solution concept and present conditions for the non-emptiness of the ellipsoidal core of a cooperative ellipsoidal game.

Keywords: cooperative games, uncertainty, ellipsoids, intervals, the core.

## Where does 'OR and Ethics' belong?

### Fred Wenstøp

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The context of this paper is where Ethics belongs in the broader OR organizational framework, should it be an independent field, or should be allied with other field(s)?

OR papers that focus on ethics can be classified according to whether they are concerned with the ethics of a special OR method or an instance of application of OR, or whether they focus on more general ethical issues that are independent of any particular method or application.

With regard to ethics, there are two main theories, duty and virtue ethics one the one side, and consequentialism on the other side. Duty ethics is concerned with rules, and virtue ethics with the character of the agents; let us use the term *principles* as a label for both. In an OR context, principles are of special relevance for the OR process, how the process was conducted and the attitudes of the persons involved. Consequentialism, on the other hand, bears on the consequences for the stakeholders in the OR process.

Thus, papers with relevance to OR and ethics can be categorized along two axes; whether they are general or specific, and whether they focus on principles or consequences. The distribution over these four categories of papers that focus on ethics in OR journals provides a useful background for a discussion of where Ethics belong within the OR framework.

Keywords: Operational Research, ethics

## **Sustainability Assessment For Solar Energy And Wind Power Projects In Con Co Island, Quang Tri Province, Vietnam \***

**Le Trinh Hai (1) Pham Hoang Hai (1) Jean Hugé (3) Nguyen Ngoc Khanh (1), Jan Kuilman (3), Luc Hens (3)**

Dr. Le Trinh Hai, Prof. Dr. Pham Hoang Hai, Prof. Dr. Jean Hugé, Nguyen Ngoc Khanh, Prof. Dr. Jan Kuilman, Prof. Dr. Luc Hens

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**Background:** The Clean Development Chemical Programme mentioned in Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change is a hot issue, in particular in developing countries (e.g. Vietnam). The programme aims to limit or reduce their greenhouse gas emissions. Solar energy and wind power are two important aspects of this programme.

**Aim:** To assess sustainability as a case study for the planned projects on solar energy and wind power on the island of Con Co, Quang Tri, Vietnam.

**Methods:** The analytic hierarchy process and multi-criteria/indicator assessment are applied to evaluate the projects.

**Results:** Scenario I provides the sustainability scores of composite sustainable development index ( $I_{CSD}$ : 0.509) for solar energy and wind power ( $I_{CSD}$ : 0.490). In Scenario II both power projects score high (solar energy  $I_{CSD}$ : 0.86 and wind power  $I_{CSD}$ : 0.838).

**Conclusions:** Multi-criteria indicator assessment was used to evaluate the two projects on Con Co Island. Based on the results of the evaluation, the projects would not only help to reduce environmental pollution but also improve local life, especially in Con Co as a poor island and important district of the province of Quang Tri. In addition, the evaluation may make the decision-makers better able to understand the values of the energy systems as part of a Clean Development Mechanism.

**Keywords:** sustainable development, clean development mechanism, sustainability assessment, analytic hierarchy process, solar energy, wind power.

## **Climate Change: A Complex Societal Process; Analysing A Problem According To The Compram Methodology \***

**Dorien DeTombe**

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In this lecture it is argued, that climate change is a complex societal problem, which should be handled according to the Compram methodology. The Compram methodology is a methodology based on the theory of societal complexity that gives guidelines to handle real life complex societal problems such as the problem of climate change. Handling according to the Compram methodology supports defining and changing a complex societal problem in a sustainable way. In this lecture the focus of the methodology is on the relation between the steps in the Compram methodology and the problem-handling phases. Some issues about the theory of societal complexity are explained, such as what are complex societal problems and how should these be handled.

Keywords: theory of societal complexity, Compram methodology, climate change.

## Different Levels Of The Ethics Discourse In Operations Research

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The ethics discourse in Operational Research can be developed at different levels. The first level has to do with the ethical standards we have to follow in our work, with the way we relate to our colleagues and to our clients, with our integrity in presenting the results of our work whether they fit or not the expectations of our clients, etc.

The second level has to do with the consequences of the decisions which are taken based on our work. For instance, shall we feel concerned by the environmental or human consequences of our work? Shall we have to question the objectives of our clients? Or that is something which must remain out of our concern?

Finally, at a third level, there is the problem of the topics which we choose to address in our work. There are some ethically relevant areas in which OR methods can give a contribution: peace, social justice, equality, sustainability, environment. Proposing new useful methodologies to be applied to these areas, or just doing sound applications of old ones, whether we mention ethics or not, is something of ethical relevance.

Second level and mainly third level are rather problematic because, on the one hand, they entail a discussion on values, and, on the other, they lead to a dramatic enlargement of the scope of the ethical discourse.

Keywords: Operational Research, ethics, decision

## **A System Dynamics Model For Improving Primary Education Enrollment In A Developing Country**

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The system dynamics approach is a holistic way of solving problems in real-time scenarios. This is a powerful methodology and computer simulation modeling technique for framing, analyzing, and discussing complex issues and problems. System dynamics modeling is often the background of a systemic thinking approach and has become a management and organizational development paradigm. This paper proposes a system dynamics approach for studying the importance of infrastructure facilities on the quality of primary education system in a developing nation. The model is built using the Cross Impact Analysis (CIA) method of relating entities and attributes relevant to the primary education system in any given community. The CIA model enables us to predict the effects of infrastructural facilities on the community's access of primary education. The resulting model enables us to predict the effects of infrastructural facilities on the access of primary education by the community. This may support policy makers to take more effective actions in campaigns that attempt to improve literacy.

Keywords: developing countries, system modeling, cross impact analysis, simulation, system dynamics, and primary education

## **Can Internationalization Of Education Be A Useful Tool For Sustainable Development?**

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Internationalization of education is an increasing global trend in higher education. This workshop will initiate with a brief overview of trends and issues in the internationalization of higher education with a focus on Turkey as a rapidly developing country. The workshop will include presentation of available national and international data to discuss the place of a developing country from multiple perspectives. The workshop will continue with a debate on knowledge economy versus learning society as a priority. Ultimately, the purpose is to discuss whether internationalization of education can be a useful tool for sustainable development.

Keywords: internationalization of education, knowledge economy, learner society, sustainable development

## Envisioning The Future Energy System

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Many decisions about future energy system are based on visions of several key stakeholders about the ideal-type system, e.g. solar village, energy independent region, 1 ton CO<sub>2</sub> society in Switzerland etc. Such visions are meaningful because they attract interest and resources and lay basis for the actual change in the energy system. However, visions-based decisions have a number of shortcomings. First, little attention is often paid to the fact that there are plural visions in the society and not all stakeholders support the same vision. Second, visions are often too generic and not contextualized to specific local circumstances, therefore, little understanding exists whether these visions are feasible, appropriate and what action is required. Third, the potential consequences of the visions becoming reality are not always anticipated in advance. We will present an approach for supporting envisioning processes with quantitative modelling and assessment so that "wise" visions of the future energy system could be developed. We will also introduce the results and insights from the real world applications of this approach in the community of Urnäsch (AR) and the canton of Appenzell Ausserrhoden in Switzerland.

Keywords: vision-based decision, energy, stakeholders

