

**PRELIMINARY CONFERENCE SCHEDULE “COMPLEXITY, UNCERTAINTY and ETHICS”**  
**14 April 2011 @ Faculty of TPM, Delft University of Technology, Delft, The Netherlands**

<b>09:00-9:20</b>	<b>Registration</b>			
<b>9:20-9:30</b>	<b>Welcome (plenary)</b>			
<b>9.30-10:30</b>	<b>Plenary 1 and 2</b>			
<b>10:30-11:00</b>	<b>Coffee/tea Break (included)</b>			
<b>11:00-12:30</b>	<b>Parallel 1A</b>	<b>Parallel 1B</b>	<b>Parallel 1C</b>	<b>Parallel 1D</b>
<b>12:30-13:30</b>	<b>Lunch (included except for students without presentation)</b>			
<b>13:30-15:00</b>	<b>Parallel 2A</b>	<b>Parallel 2B</b>	<b>Parallel 2C</b>	
<b>15:00-15:30</b>	<b>Coffee/tea Break (included)</b>			
<b>15.30-17:00</b>	<b>Parallel 3A</b>	<b>Parallel 3B</b>	<b>Parallel 3C</b>	<b>Parallel 3D</b>
<b>17:00-17:30</b>	<b>Plenary 3</b>			
<b>17:30-17:40</b>	<b>Closing remarks</b>			
<b>17:40-18:00</b>	<b>Drinks (included)</b>			
<b>18:00-...</b>	<b>Dinner</b>			

**PLENARIES**

***Plenary 1: Complexity, Deep Uncertainty, and Ethics***  
**Erik Pruyt & Jan Kwakkel (Delft University of Technology)**

***Plenary 2: Ethics and socio-technical systems***

**Maarten Franssen, Peter Kroes, Ibo van de Poel, Sjoerd Zwart (Delft University of Technology)**

**Abstract:** Any form of intervention in the behavior of socio-technical systems, from redesigning, managing to nudging those systems, raises prima facie ethical issues, since interventions in socio-technical systems may affect the well-being of many people, some positively and some negatively. However, it is not clear at all how ethical issues at this socio-technical system-level may be /have to be conceived. In our contribution we will make an attempt to explore the various ways in which ethical issues with regard to interventions in socio-technical systems differ from ethical issues related to actions of individual persons. In our analysis we will focus on the notion of intervention itself (what kind of action with regard to socio-technical systems constitutes an intervention and what kind of interventions may be distinguished from an ethical point of view) and various form of (“deep”) uncertainty accompanying interventions in socio-technical systems. Finally, we will discuss whether framing interventions in socio-technical systems as societal experiments may be a promising way of dealing with the ethical issues related to those interventions.

***Plenary 3: Dealing with conflict & uncertainty in facilitated modelling: decision development in modelling sessions***

**Etienne Rouwette (Radboud University Nijmegen) and L. Alberto Franco (University of Warwick)**

**Abstract:** While the facilitated modelling literature recognises the importance of the group process within facilitated modelling workshops, published empirical research rarely examines their dynamic nature. In this paper, we address this gap in the literature in two ways. First, we propose to locate facilitated modeling workshops as the main focus of investigation, and adopt decision development as the analytical lens. Second, we provide guidance regarding how to implement a research strategy that is informed by such a focus. We start by mapping the different conceptualisations of decision development that seem embedded within the facilitated modelling tradition, and contrast them with theoretical models from the group communication field. Our analysis identifies a number of potentially useful areas for the study of facilitated modelling workshops from a decision development perspective, and articulates a number tentative research questions and testable propositions amenable to empirical research. Central to our proposal are research methods for the study of dynamic group processes. We thus discuss the steps required to extract group process data from facilitated modelling workshops that are usable and open to analysis. This includes a review of issues regarding research design, coding scheme development, data coding and choice of analytical techniques. Finally, we offer conclusions and briefly discuss some feasibility issues related to the implementation of our proposal.

## COMPLEXITY

### SESSION: SD APPLICATIONS MOBILITY – PARALLEL 1A

#### *Airport Planning under Deep Uncertainty*

**Jan Kwakkel (Delft University of Technology)**

**Abstract:** The air transport industry operates in a rapidly changing context. Changes in ownership structure, initiatives like Single European Sky and the Open Skies treaty between the United States and Europe, the introduction of new aircraft such as the Airbus A380 and the Boeing 787, and advances in Air Traffic Management technology radically alter the functioning of the sector. Airports are a crucial element in this system and are major drivers of regional and national economies. Their long-term planning is therefore of crucial importance. This paper explores how exploratory modeling and analysis can be used to support the design of dynamic adaptive plans that can successfully guide the development of the airport across a wide range of conceivable plausible futures.

#### *Op weg naar Duurzame Mobiliteit*

**Paul Bogerd (Minase Consulting) en Rob Weterings (TNO)**

**Abstract:** Het Nederlandse mobiliteitssysteem vertoont alle kenmerken van een complex en dynamisch systeem. Problemen die zich voordoen - zoals files, vertragingen, ongelukken, vervuiling – hangen onderling samen en laten zich dan ook niet met eenvoudige maatregelen oplossen. Het mobiliteitssysteem is daarmee een ideale kandidaat voor modellering met SD. Om de kennisbasis te leggen voor een samenhangende visie en strategie gericht op duurzame mobiliteit is in samenwerking tussen Minase en TNO een start gemaakt met een ‘integraal’ (kwalitatief) model van het mobiliteitssysteem van Nederland. Hierbij zijn de krachtige relaties binnen dit systeem in beeld gebracht en zijn belangrijkste feedback loops geïdentificeerd. Zo is samenhang en structuur gebracht in de vele aspecten waarop het mobiliteitsysteem kan worden verbeterd, variërend van verbetering aan het voertuig om brandstof efficiency te vergroten, tot technologieën die erop gericht zijn om multimodale vervoersstromen beter over het Nederlandse netwerk te verdelen. De presentatie gaat in op het model, de rol ervan in bovengenoemde trajecten, en op de mogelijke toekomst van het model: de ambitie is om er een ‘open source’ model van te maken.

#### *System Dynamics of Airport Choice*

**Bart Steverink (BS) and Els van Daalen (Delft University of Technology)**

**Abstract:** In July 2008 the Dutch government introduced a tax on airline tickets in order to internalize the negative externalities associated with air travel. As a result of the increased ticket price in The Netherlands a substantial number of passengers decided to depart from airports outside of The Netherlands. However, after the tax was abolished one year later passengers kept using foreign airports. Because existing traditional discrete choice models do not explain this asymmetric response a system dynamics model was developed to model mechanisms of information exchange related to airport choice. The simulations show that the development of awareness of an airport plays an important role in the asymmetric response. Further research should be conducted to assess the influence of macro-economic factors and specific airline strategies.

***The Dutch housing market***

**Martijn Eskinasi (Planbureau voor de Leefomgeving)**

**Abstract:** This paper describes work in progress on Houdini: a system dynamics housing market model, focused on proposed reforms of the Dutch housing market. The model is largely based on extensive literature on the woes of the Dutch housing market and was reviewed by a well-established expert panel, including universities, ministries and the economic assessment agency. The core model structure has its foundation in the diPasquale and Wheaton real estate markets model, an implicit system dynamics model. We report on the Houdini model structure, validation, base run, policy experiments and follow up activities.

***Exploratory Modeling and Analysis of the Social Housing Market of the Randstad***

**Andre de Groen (Delft University of Technology) [In het Nederlands]**

**Abstract:** An exploratory System Dynamics model about the Social Housing Market in the Randstad will be presented. This model will be used to explore parametric and structural uncertainties.

***Modeling and Simulation of the Inertia in Energy Transitions in the Built Environment***

**Gonenc Yucel (Delft University of Technology)**

**Abstract:** The residential sector accounts for 30% of the total energy consumed by all sectors on average worldwide. This significant share makes an energy transition in the residential sector one of the most important frontiers of sustainability transitions. Netherlands aims to achieve a remarkable reduction in the energy consumption in residential buildings with policies mainly aiming at new constructions, and little attention is being paid to the existing dwelling stock. However, the existing dwelling stock creates an inertia against a transition. Although this is a widely accepted issue, the extent of such an inertia has not been analyzed explicitly. In that respect, we aim to conduct a preliminary study in order to demonstrate the importance of the existing dwelling stock, and the inertia it can cause during an energy transition process. Besides, we also aim to explore effectiveness of certain policy options that can alleviate this inertia. For that purpose, a simulation model is developed and initialized based on the Dutch housing system. The set of experiments discussed in the paper provides a better understanding about this inertia, as well as what needs to be done for achieving significant progress in a residential energy transition.

***Exploring the Uncertainty of Energy Transitions: The Case of World Wind Power***

**Caner Hamarat (Delft University of Technology)**

**Abstract:** Models are frequently used for decision support in modern day decision making. This approach is referred as model-based decision support and it is mostly at least implicitly used for predictive purposes. However, predictions are almost always wrong and can be dramatically misleading for policy making. Another shortcoming related to the predictive use is the lack of proper consideration of deep uncertainty. Deep uncertainty refers to the lack of knowledge or disagreement related to the correct representation of a system and the evaluation of (model-based) outcomes. This paper proposes to embrace deep uncertainty by using models in an exploratory way in order to improve model-based decision support under deep uncertainty. For this purpose, a new research methodology for analyzing complex and deeply uncertain systems - Exploratory Modeling and Analysis- is combined with System Dynamics modeling to capture deep uncertainties and dynamic complexities related to energy transitions. In this paper, we illustrate this methodological approach by using three different versions of a world wind power model (to introduce structural uncertainties) and by introducing some parametric uncertainties. This case clearly illustrates the need to consider both structural and parametric uncertainties for technology management under deep uncertainty.

***Long-term System Dynamics of Indium as a By-Product of Zinc***

**Snorri Sigurdsson Norddahl (Delft University of Technology / TNO)**

**Abstract:** Our growing consumption of resources is starting to trigger concern of effects of mineral scarcity on our society. The increasing demand for minerals is starting to become difficult to meet because new extraction sites are discovered at a lower rate and they are becoming hard to access. The paper focuses on mineral scarcity by looking at the dynamics of the production of Indium as a by-product of Zinc and the effects of implementing recycling in large scale to the processes. The effects will be modelled with the system dynamics methodology and the inter-relation and dynamics of the system will be captured. Scenarios will be created to gain understanding about future behaviour. Anticipated results are that recycling will affect the supply of Indium greatly and could reduce the supply risk many countries are facing as they are mainly importers of Indium.

***The future of copper in sustainable electricity infrastructure - exploring the global copper market over the next 30 years***

**Willem Auping (Delft University of Technology / TNO)**

***Rich Social Simulation for Complexity***

**Virginia Dignum (Delft University of Technology), Frank Dignum (Utrecht University), Catholijn Jonker (Delft University of Technology)**

**Abstract:** The conflict in Afghanistan, the contrasting views on energy issues and the diffusion of the iPhone are just three random examples of the many societal issues that are affected and determined by social interactions. Differing dramatically concerning their impacts on human lives, these examples exhibit remarkable similar complex social processes, such as the formation of norms, changes in networks, shifting opinions and polarizations, to name but a few. An important aspect of these processes is that memorized previous interactions will affect future interactions and the valuation and processing of additional information. Hence a person who originally was ambivalent on an issue, may take a particular stand after interacting with a few people. This may lead towards a strengthening of beliefs and even radicalization. Capturing such social cognitive dynamics in scientific models seems relevant in understanding, and possibly the management of complex societal issues.

In studying the dynamics of social interaction in a variety of fields, social simulation has come about as a promising tool. Also cognitive models have been developed to describe the processes of information handling. However, how cognitions both determine and are shaped by social interactions is hardly being addressed by these models. In this paper, we will focus on rich socio-cognitive simulation models. Our ultimate aim is to develop an integrated model of the combined influence of personality, culture, and social influence on the individual's decision making on behaviour. We build on our previous work on the influence of culture on trade processes and on our experience on a computational model of the influence of personality on an agent's reasoning.

***A Complex Network Perspective on the World Science System***

**Scott W. Cunningham and Jan H. Kwakkel**

**Abstract:** This paper discusses capabilities for a systematic overview of world science delivered from the use of new output indicators of science and technology. The data may be usefully structured using a complex network perspective on national publication and international collaboration. This paper uses a random sample of publication data from 2009 to provide a timely update on world activities in science. A mixed predictive and descriptive approach is used in analyzing the data. A variety of methods including structural network analysis, and network regression, are used in the exploration of this sample. Insights are gained into key participants in world science, their positioning in a network of collaborative relationships, and the resultant morphology of the network which emerges from a mixture of random and geographic factors.

***Standards battles for complex systems: inter-organizational networks and flexibility***

**Geerten van de Kaa (Delft University of Technology)**

**Abstract:** Most literature on standard selection focuses on compatibility standards for single products or large but single systems that are developing, such as the internet or a telecommunications network. In this study, we focus on systems that connect multiple existing subsystems and new subsystems to form a new complex system. We hypothesize that in these systems, the composition of the networks of actors that are supporting the different competing standards and the flexibility of these standards plays an important role in establishing dominance. We test these hypotheses using data that comes from a database that we have created for this study and we find support for these hypotheses.

***Analysing the comprehensive approach of defense, diplomacy and development in fragile states using MARVEL***

**Peter van Scheepstal (TNO)**

**Abstract:** In many post-conflict areas a multitude of military and civil actors are active in the areas of security, governance, and development. Each actor has its own knowledge, expertise and approaches, but together they influence the same society. Therefore actions of one actor on one domain will influence the domains that other actors focus on. Ideally they coordinate their activities in a so called comprehensive approach. To support the comprehensive approach it helps to capture the complex picture of different approaches, dependencies and knowledge of the situation. This presentation will show a structure and method to support this analysis using a dynamic qualitative modeling technique called MARVEL.

***Global tourism and climate mitigation; a serious game***

**Paul Peeters (NHTV Breda University of Applied Sciences / TU Delft / WU)**

**Abstract:** Long term projections show the carbon footprint of the global tourism sector to become very problematic. The sector uses ethical arguments to evade measures like taxing aviation, causing a deadlock in effective mitigation policy making. The paper uses system dynamics to represent this complex system and explore emission reductions without damaging the industry. The need for long term insights, and a fundamental lack of data and theory all contribute to deep uncertainty. The paper shows limits to technological solutions and a need for behavioural change. Serious gaming might be a way out of the political deadlock.

***De Ecopolicy game***

**Mike J.R. van de Wijnckel (Van de Wijnckel Adviezen BV)**

**Abstract:** In deze presentatie wordt de Ecopolicy game gepresenteerd. Ecopolicy is een simulatiegame om te leren systeemwerken. In de game moet een team een land zo leren besturen dat de leefbaarheid verbetert. Ecopolicy past bij thema's zoals duurzame ontwikkeling, nieuw bestuur, onderwijsinnovatie en demografische ontwikkelingen. In meerdere landen worden Ecopolicyade jongerencompetities gestart. In Duitsland spelen duizenden scholieren mee voor de finale in de Bondsdag in Berlijn. Afgelopen jaar is dit ook voor Nederland gestart. Via deze presentatie worden deelnemers uitgenodigd om te helpen dit jongerenproject te verspreiden in het Nederlandse onderwijs. Deze presentatie en aansluitende workshop is bestemd voor deelnemers die zeer snel willen ervaren wat systeemwerken betekent in de praktijk.

SESSION FOR INFORMAL THESIS PRESENTATIONS OR LATE ‘HOT’ CASES

***Gaming to Speed Up the Dutch Energy Transition: from experiments to multi-actor systems gaming***  
**Iman Mohammed (Delft University of Technology)**

**Abstract:** This NWO research is motivated by the observation that the adoption of modern advanced technologies in the Dutch energy system is associated with inertia despite the urgency of the anticipated problems and the substantive system delays. The research therefore aims at revealing twofold insights into, on the one hand, factors that contribute to inertia and on the other policies that can be used to mitigate such inertia and accelerate the transition. Interactive games are therefore developed and used to study the behaviors and interactions among actors with different attributes, goals and interest in relation to energy transitions and confronted with different governance models and policy scenarios for public policy purposes.

***Demographic ageing and its implications for the Dutch welfare state: an Exploratory System Dynamics approach***

**Thomas Logtens (Delft University of Technology)**

**Abstract:** The influence of future demographic changes, in particular ageing, on the aspects of the welfare state (i.e. housing, social security and health care) and labour market in The Netherlands are explored in this research by means of System Dynamics Modeling and Exploratory Modeling and Analysis. Population ageing is mainly caused by a decrease in fertility rate and an increase in life expectancy and is expected to face a large part of the world’s industrialized countries. The main question answered in this work is therefore: What are the consequences of demographic shifts and population ageing in The Netherlands for labour supply, financing and societal costs in health care, social security, housing and the labour market, taking into account future uncertain factors?

## ETHICS

### *SESSION: Ethics + Complexity/Uncertainty – PARALLEL 1C*

#### ***Conflict Theory, Complexity and Systems Approach***

**Giorgio Gallo (Interdisciplinary Center Sciences for Peace, University of Pisa)**

**Abstract:** In the twenty-first century we are witnessing conflicts more and more complex, requiring a paradigm shift. On the one side a shift from “State Security” to “Human Security”, and on the other side a shift from a “pre-complexity” mindset to a “complexity” one. Too often linear reasoning is the way conflicts are approached, with often disastrous results. Feedback are most often disregarded, but, most important, the complex dynamics which make a conflict to change over time, following paths difficult to predict, are rarely taken into account. In the paper, also by means of concrete examples, we will try to show how a Systems Thinking approach is essential in analyzing today's conflict, in preventing them and in operating to make them to develop along nonviolent constructive paths rather than along violent destructive ones.

#### ***A Modelling Project Supporting an Outsourcing Decision – Did We Miss an Opportunity to Speak “Truth to Power” and Get Ourselves “a Better Client”?***

**Andreas Größler (Radboud University Nijmegen)**

**Abstract:** Compared to interventions typically described in the system dynamics literature, a modelling project supporting an outsourcing decision within a major IT company was oriented towards supporting pre-established business objectives. This results in the questions (a) whether it was a manipulative use of system dynamics and (b) whether—if some of the participants do not agree with project objectives—a participative modelling approach is well suited as an organisational intervention?

The talk presents the case study and highlights the ethical concerns linked to using modelling and simulation in highly political settings within big companies. In addition, some preliminary answers based on existing literature from within and from outside the system dynamics field are provided.

#### ***Ethical Considerations in Developing Adaptive Policies for Situations Involving Deep Uncertainty***

**Warren E. Walker and Vincent A.W. J. Marchau (Delft University of Technology)**

**Abstract:** Uncertainty is at the heart of the very nature of policy analysis. The objective of policy analysis is to help policymakers make decisions about the future – decisions that affect people. The future is impossible to predict. But, decisions must be taken in spite of there being uncertainty about the future situation, about the outcomes from the decision, and about the future valuation of the outcomes. These types of uncertainties taken together have been called ‘deep uncertainty’. Here, decision making is faced with the prospect of surprise – and the failure of policies that are based on assumptions that do not come to pass. Policymakers are often tempted to ignore deep uncertainty. However, ignoring it could lead to large adverse consequences for people, countries, and the earth. So, it is important for policy analysts and policymakers to accept, understand and manage it.

Recently, a structured, stepwise approach to making policies in the face of deep uncertainty has been developed called Dynamic Adaptive Policymaking (DAP). In this paper, we review the steps of DAP and specify tenets of good practice in each step. We conclude that following the tenets of good practice will assure the ethical conduct of the analyst.

***Global risks, local conflicts and universal moral dilemmas: the CO<sub>2</sub> underground storage pilot-project in Barendrecht, The Netherlands.***

**Claudia Basta (Wageningen University)**

**Abstract:** In the course of 2009 the municipality of Barendrecht (The Netherlands) engaged in an open conflict with the Dutch government in relation to the proposed siting of a CO<sub>2</sub> underground disposal. The technology promises to contribute to abating carbon dioxide emissions, as it consists of capturing them “at source” and storing them underground into exploited gas fields. The Dutch Applied Research Institute (in the following: TNO), which assessed the most appropriate location for siting the storage within the national territory, considered 12 possible locations, concluding that Barendrecht (the only densely populated among them) is the most suitable candidate for proceeding with the pilot-project. The alleged motivation is that “capture and storage of CO<sub>2</sub> is a necessary transition technology to help cut carbon emissions” (Reuters, November 18, 2009). The story-line of the Barendrecht case would recall a typical facility siting conflict (Boholm and Lofsted 2004) if not for some highly specific, hence particularly interesting aspects. First of all the benefits associated to the Carbon Capture and Storage technology are of global, and not only of national or regional relevance; furthermore, the uncertainties regarding the possibility and effects of large-scale leakages of CO<sub>2</sub> are still many, and the experience still too little to provide extended and reliable historical data (Gale 2004). By taking the Barendrecht case as a paradigmatic example, the paper reflects on the emergence of global vs. local risks and in particular on the desirability of technologies meant to mitigate the former, while creating the latter, from a rigorous ethical perspective. By making the implicit ethical considerations which may underlie the adoption or rejection of such technologies explicit, the paper intends to offer a solid point of departure to the debate on the desirability of CCS as a climate change mitigation strategy.

***Moral emotions and risk politics***

**Sabine Roeser and Sofia Kaliarnta (Delft University of Technology)**

**Abstract:** Risky technologies such as nuclear energy, GM-food and nanotechnology often cause heated and emotional debates. However, emotions are generally excluded from political decision making about risky technologies, since they are viewed as irrational states. This approach is based on a deficient conception of emotions. Moral emotions, like sympathy and indignation, are necessary in judging ethical aspects of technological risks, such as justice, fairness and autonomy. Risk policy should include the moral emotions of experts and stakeholders. This paper examines various policy making approaches concerning risky technologies and compares the extent to which they do or can incorporate moral emotions.

***Ethical arguments behind management of invasive alien species: The case of the raccoon dog invading Norway***

**Fred Wenstøp (Norwegian School of Management BI)**

**Abstract:** Invasion of alien species is a threat to biodiversity, and many countries have developed management plans and programs to abate the threat. The main argument for such actions is consequential, where the objectives are to preserve biodiversity and to limit other detrimental consequences. But interestingly, one frequently hears other arguments based on different kinds of ethics. One strategy is to try and demonize the invader by arguing that it is devoid of virtue, another type of argument is that the alien has no right to invade. This paper analyzes ethical reasons for public policy in Norway concerning the raccoon dog.

***Organisation & meaning of ethical guidelines. The example of autonomy values and care for the elderly.***  
**Emmanuel Picavet and Dawidson Razafimahatolotra. (LRPLA team, Franche-Comté University)**

**Abstract:** Ethical guidelines are important in the social tasks of organisation. In this contribution, we explore how ambiguity impacts the collective way to face concrete organization challenges. For example, there is considerable ambiguity around the notions of “autonomy”, “dependence” and “solidarity”, when it comes to planning appropriate care and support for elderly, with their handicaps and specific needs. In this field, there is considerable effort to try to adapt institutional organisation to the expected demographic, medical and social evolution. But these efforts are complicated by interpretative disagreement about autonomy and solidarity.

***Application of moral dilemmas to industrial engineering students***  
**Cristóbal Miralles and J. Félix Lozano (Universitat Politècnica de València)**

**Abstract:** This communication presents the results of applying a moral dilemma to Industrial Engineering students at the Universitat Politècnica de València (Spain). It is a cross sectional survey, made over the last five years, that enables us to extract some interesting conclusions on the moral evolution of our students. The dilemma was constructed following the outline of Kohlberg's stages of moral development, and was specifically designed for students in the last year of a master degree; who are ready to become future (and present) managers in Spanish companies. Starting from a typical situation for a manager, the dilemma includes six additional pieces of information that increase the complexity of the decision making process; incorporating new stakeholders that also need to be considered.

***Ethical issues addressed in the Compram methodology***  
**Dorien DeTombe (Chair Int. Research Society on Methodology of Societal Complexity)**

**Abstract:** Complex societal issues such as floods, climate change and credit crisis generate effects on multi levels, in multi states and sometimes to multi continents. There is much uncertainty concerning the knowledge, power and emotion of these problems. Multi disciplines are necessary to get insights in these problems. Therefore a multi disciplinary approach is needed. Handling complex societal problems includes many ethical issues regarding the handling process itself, the selected actors and the goals. The Compram methodology is framework methodology, including many methods and tools using a multi disciplinary multi level approach which includes knowledge, power and emotion including ethical issues.

**SESSION: MCDA and Ethics – PARALLEL 2D**

***Multi-Actor, Multi-Criteria Analysis (MAMCA) for complex decision problems***

**Macharis Cathy**

**Abstract:** In this contribution the multi-actor multi-criteria analysis (MAMCA) method is presented. This evaluation methodology specifically focuses on the inclusion of the different actors that are involved in the decision problem, the so called stakeholders. As the traditional multi criteria analysis, it allows to include qualitative as well as quantitative criteria with their relative importance, but within the MAMCA they represent the goals and objectives of the multiple stakeholders and by doing so allow to include the stakeholders into the decision process. The theoretical foundation of the MAMCA method will be shown and how this methodology deals with complexity and uncertainty.

***New trends on the Theory of Justice and Multicriteria Decision Aiding***

**Joao Climaco (INESC-Coimbra)**

**Abstract:** Recently, A. Sen wrote a very important book: “The Idea of Justice”. The author discusses and compares his new proposals with the Rawlsian Theory of Justice. Among his new ideas, the concept of “capability” plays a key role. He considers that total comparisons getting “complete rankings” can not be adequate to measure “capability” and suggests other approaches taking into account interpersonal information. Of course, aggregation procedures play a very important role in MCDA. In this communication we try to follow the ideas of Sen concerning the informational bases of different ethical frameworks looking for their connections with aggregation rules, in order to discuss the present and the future of MCDA approaches.

**SESSION: GAMING WORKSHOP De Ecopolicy game PARALLEL 3D**

By Mike J.R. van de Wijnckel (Van de Wijnckel Adviezen BV)

OTHER (MODEL-BASED) GAMING SESSIONS COULD BE ACCOMMODATED IN PARALLEL SESSIONS 1D AND 2D (laptops and network access will be provided in parallel room D)

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For updates of this preliminary schedule, see: <http://simulation.tbm.tudelft.nl/BeneluxChapter/News.html>  
For more information, please contact Erik Pruyt ([E.Pruyt@tudelft.nl](mailto:E.Pruyt@tudelft.nl)) or + 31 15 2787468 (office).