

## European Joint Masters in Management & Engineering of Environment and Energy (ME3)

Tuesday 5 July 2011 / Amphithéâtre Georges Besse ou Sadi Carnot

8h  
jury A



**Joshua WAUTHY**

**KTH Royal Institute of Technology (Stockholm, Sweden)**

**Techno-Economic Feasibility Study of small-Scale Wind-to-Hydrogen Systems Applied to a Greek Island.**



KTH Industrial Engineering and Management

The Royal Institute of Technology (Kungliga Tekniska Högskolan, KTH), is a leading technical university with first-class education and research. Founded in 1827, it is one of Scandinavia's largest institutions of higher education in technology. It accounts for one-third of Sweden's technical research and engineering education capacity at University level and is respected worldwide especially in the domains of technology and natural sciences.

The purpose of this project is to conduct a techno-economic assessment and modeling of a wind energy system with hydrogen storage as applied to a remote island in Greece. The rationale is to minimize the unreliability of intermittent wind energy while maximizing its capacity by producing cost effective and clean electrolytic hydrogen which can be used as an energy storage medium and/or as a transportation fuel. The intent is to explore the feasibility of this system in terms of technological and economical aspects as well as to discuss the environmental and social facets.

8h  
jury B



**Luca LO RE**

**Alstom, Baden, Aargau (Switzerland)**

**Sustainability Management: sustainability as a differentiation strategy.**



Alstom is the world leader in the supply of Environmental Control Systems (ECS), covering the whole product range of turnkey NOx, SOx, Mercury and Particulate Matter control systems for both large scale Power Plants and Industrial customers. Air quality is now a leading global concern in government and industry alike, making ECS a key strategic product line among Alstom's offerings.

The thesis focuses on the development and implementation of a sustainability strategy to be used by Alstom Power ECS R&D Programs as differentiator in the market, in order to keep the world leadership in the sector and to counteract the entrance of new players in the market, especially from Asia. The project covers the use of leading edge R&D management tools to integrate sustainability concepts into the Product and Technology Development Quality process. It also investigates the possibilities to turn the implementation of sustainability into standard certifications to be used as market trade barriers or as competitive advantage with the clients.

9h10  
Jury A



**Ali ZAFAR**  
**KTH Royal Institute of Technology (Stockholm, Sweden)**

**Techno-Economic Assessment of Parabolic Trough/Stirling dish solar systems for Utility-scale application in a Greek Island.**



KTH Industrial Engineering and Management

The Royal Institute of Technology (Kungliga Tekniska Högskolan, KTH), is a leading technical university with first-class education and research. Founded in 1827, it is one of Scandinavia's largest institutions of higher education in technology. It accounts for one-third of Sweden's technical research and engineering education capacity at University level and is respected worldwide especially in the domains of technology and natural sciences.

The thesis focuses on studying the technical and economic feasibility of utility scale deployment of concentrated solar power systems in the Greek Islands. For the purpose of current study, parabolic trough systems with thermal energy storage and the Stirling dish solar systems are considered. The objective was to estimate and compare the amount of annual energy output, levelized cost of electricity (LCOE), after tax cash flows and annual rate of return for separate deployment of both technologies. Simulation and modeling has been done with System Analyzer Model (SAM) based on the weather data files generated from Meeonorm for the specific location. The present research is expected to assist policy makers, investors at National and International level in their quest for applications of these technologies as a solution for the growing electricity demands of the understudy Greek Island.

9h10  
Jury B



**Venkata Phani Bhushan TADEPALLI**  
**Alstom Switzerland Ltd (Baden, Switzerland)**

**Market Study & Techno-Economic analysis for Low Grade Waste Heat Recovery.**

**ALSTOM**

Alstom is a global leader in power generation, power transmission and rail transport.

Alstom Power provides turnkey integrated power plant solutions and associated services for a wide variety of energy sources, including gas, coal, hydro, nuclear and wind, and it offers a wide range of solutions for power transmission, with a focus on smart grids.

The objectives of the master thesis are:

- Identify the sources of waste heat from furnaces in Iron and Steel, Aluminum and Cement Industries.
- Characterize the market size per industry & estimate the technical characteristics of the waste heat.
- Identify financial incentives and investment subsidies for waste heat capture (Industrial Energy Efficiency) available in various industrialized countries
- Assess the technical & economic potential of various means of using waste heat for Desalination, Electricity Generation using Organic Rankine Cycle, District Heating and Absorption Cooling
- Estimate the amount of reduction of Greenhouse Emissions by utilizing the surplus heat
- Combining all the above, the final objective is to prepare business cases by performing cost benefit analysis for each means of utilization

10h30  
jury A



**Pradyumna BHAGWAT**  
**Alstom Power AB (Vaxjo, Sweden)**

**Dynamic Simulation of Dry Flue gas Desulphurization.**

**ALSTOM**

Alstom is the leader in the field of dry flue gas cleaning. The latest addition to the Alstom DFGD solution is the NID-Novel Integrated De-acidification. The NID system consists of three main processes integrated in each other.

- Absorption of SO<sub>2</sub> and HCL
- Collection of Dioxin and heavy metal
- Collection of particles

The objective of the Master's thesis project is to create a dynamic simulation of the NID system using MATLAB-SIMULINK software.

The simulation will be divided into four main components of the NID – Reactor, Fabric Filter hopper and Mixer/Hydrator. Mass and Energy Balances are formed for each component and will be converted in to SIMULINK models. These models will be interlinked and various design parameters will be defined. This simulation will be validated with actual pilot plant data and calibrated to get accurate simulation.

The simulation should be created in a way that would make it possible to use it in the future for developing control algorithms, operator simulation and qualitative process understanding.

10h30  
jury B



**ALSTOM**

**Pei Ling KOH**

**ALSTOM Management (Levallois-Perret)**

**Carbon Disclosure Project –benchmarking, improvement process, carbon management strategy.**

ALSTOM is a large French multinational conglomerate which holds interest in Power, Transport and Grid market that covers activities in more than 90 countries with over 100,000 employees. My placement is in the corporate level Environment, Health and Safety (EHS) department. The department in charge of deployment of EHS that is able to influence all the businesses across the globe. Main project involved includes review of EHS Roadmap that is used for assessments of all projects and sites, and Carbon Disclosure Project (CDP) 2011 for ALSTOM.

The thesis focuses on CDP. Climate change is a global challenge that will have a major impact on future of business environment. CDP is launched as results of investor's interest to assess the risk presented by climate change and for benchmarking management initiatives. The main objective of the project is in short term to improve Alston's position in the next edition of CDP and in long term to define the strategy and action plan to be implemented in a more long-term sustainable way of improvement. Main work includes benchmarking, defining risk and opportunity of climate change, GHG emissions and improvement action plan.

11h40  
jury A



**ALSTOM**

**Javier Eliseo GALVEZ RAMIREZ**

**Company: Alstom Power Sweden AB (Växjö, Sweden)**

**Practical Aspects of Nanocoatings.**

ALSTOM is the world leader in integrated power plants for the production of electricity and air quality control systems. Alstom has solutions for all energy sources (coal, gas, nuclear, fuel-oil, hydropower, wind) and is a leader in innovative technologies for the protection of the environment (reduction of CO2 emissions, elimination of pollutant emissions, etc.). The Group is also developing CO2 capture processes and has integrated this technology in pilot plants in Germany and USA. Alstom also supplies rolling stock, transport infrastructure and signalling, maintenance equipment and global rail systems. Alstom Power Environmental Control System (ECS) is a global supplier of equipment for removing emissions from power plants and industries. The internship takes place in this Alstom Division.

The M. Sc. Practical Aspects of Nanocoatings Project born out of the necessity to solve some problems found in ECS products which could be properly approached by nanotechnology, but it is necessary to pay special attention on the material selection because is of great importance to reduce ECS product's maintenance and improve its lifetime. The main objective of this project is to map and classify different nanomaterials according to their final properties and the practical aspects involved in applying the nanomaterial as a coating. Moreover, the mechanisms involved in the applying process should be investigated and conclusions should be drawn regarding on its practical implications in industrial processes. As a result, it will be necessary to determine the applicability of superhydrophobic/anti-adhesive and corrosion/wear resistant nanocoatings in ECS products working at industrial-scale to avoid and prevent problems such as clogging, corrosion and erosion on its equipment.

11h40  
jury B



**Bloomberg**  
NEW ENERGY FINANCE

**Tiji SCHMELZER**

**Bloomberg New Energy Finance (London UK)**

**Effect of Energy Smart Technologies on the Power Market.**

Bloomberg New Energy Finance is the leading provider of independent analysis, data and news on clean energy and the carbon markets. Its 180 specialists have been helping their clients find and create value in these fast-moving markets since 2004. They are located in 11 offices worldwide, with headquarters in London.

This dissertation covers the impact of emerging disruptive clean technologies on European electricity markets. For this purpose, a long-term electricity load forecasting model was developed. Using a scenario driven approach, the results are analyzed to predict the effect for key stakeholders. Of special interest are the altered intraday load variations, which have a substantial effect on the volatility of wholesale electricity spot prices and thus on the economics of generation facilities.

The forecasts will be used as an input of other Bloomberg models, while the results of this investigation are published as Research Notes which are distributed amongst the subscribers of the Bloomberg Power service.

14h  
jury A



**Sebastian Ignacio CEPEDA HARO**

**ENERCAP (Energy Carbon Performance SAS) (Rillieux-La-pape, 69)**

**PV lamps in sub-Saharan countries - opportunities and challenges for CO2 emission reductions projects.**



ENERCAP is an Energy and Carbon Strategy Consulting firm based in Lyon, France. The mission of the company is to aid private and public entities to define, implement, and finance their energy and carbon strategies.

The thesis focuses on evaluating the opportunities and challenges for the replacement of kerosene lamps in Africa. An estimation of the size of the market, a diagnosis of the main barriers and the requirements to install a project from a technical, economical and organizational point of view will be reviewed.

An important focus is the CO2 emission reduction project under the Clean Development Mechanism (CDM). It will be quantified the achievable reductions and the risks associated to present this type of projects under this scheme. It will be evaluated economically, if the CO2 emissions are enough to help to surpass the barriers for the deployment of this type of projects.

The thesis will deliver to ENERCAP relevant information to evaluate the potential market and to know the technical and organizational requirements in order to prepare the deployment of a project of kerosene replacement in the sub-Saharan countries.

14h  
jury B



**Roderick VAN ZUYLEN**

**Vattenfall Energy Trading Netherlands N.V. (Amsterdam)**

**Mitigation of weather related risk on the TTF gas market; A Vattenfall case study.**



The Swedish Vattenfall is Europe's fifth largest generator of electricity and the largest supplier of heat. By its 2009 acquisition of Holland's largest retail gas supplier Nuon Energy N.V., which now constitutes Vattenfall's business group Benelux, it acquired a significant market share in the European gas market.

For this project, the influence of weather variables on the price of natural gas has been studied. The findings form the foundation for Europe's trend to move away from oil-indexed gas prices towards a gas price that is purely market based. A hedging strategy to cover the weather related risk is discussed and its associated cost calculated.

15h10  
jury A



**Alfonso Miguel MARTINEZ CERON**

**ENERCAP (Energy Carbon Performance SAS) (Rillieux-La-pape, 69)**

**Evaluation of Six Sigma Implementation in the Energy Master Plan of the State of New Jersey.**



ENERCAP is an Energy and Carbon Strategy Consulting firm based in Lyon, France. The mission of the company is to aid private and public entities to define, implement, and finance their energy and carbon strategies.

The State of New Jersey is facing new energy and environmental challenges that are putting at stake the welfare and health of NJ's residents. Business as Usual (BAU) scenarios will lead to an energy environment less reliable and environmentally irresponsible. Therefore, the Energy Master Plan (EMP) addresses those challenges by proposing a set of actions and goals to direct NJ's residents towards a more responsible energy future which will maximize energy conservation & energy efficiency and develop an energy infrastructure.

The objective of this thesis project is to assess the feasibility and opportunities of implementing the Six Sigma Methodology in the EMP by offering axes of actions that will help to assure that environmental requirements in the State of New Jersey are going to be fully achieved. Within the context of Six Sigma Methodology, benefits, obstacles and limitations of developing potential quality projects are going to be highlighted. Finally, it will be presented whether Six Sigma represents a good tool to achieve EMP's goals.

15h10  
jury B



**Tijana DURIC**  
**BASF SE (Ludwigshafen, Germany)**  
**Sustainable Development of Plastic Packaging Industry in China.**

BASF is the world's leading chemical company with sustainability as an integral part of its strategy. Being strongly positioned in Europe and the Americas, BASF is also committed to investment in growth markets such as Asia. China is experiencing an industrial boom, constrained with climate change programmes and social turbulences. The five-year plan, which is hailed as the greenest strategy document in the country's history, is a committing document with a real impact not only on the environment, but also national economy. In an emerging economy such as China's with a take-it-or-leave-it attitude, BASF is developing strategies to secure its position in plastic industries. Research will be conducted to determine the environmental and economic implications of using plastics in packaging and examine relevant regulations and industry trends. The project will answer the question how the company's plastics business is positioned on key sustainability issues in the plastic sector and will provide a proposal for advocacy and global communication tools.

16h20  
jury A



**Diego PINA PEREZ**  
**ENERCAP (Energy Carbon Performance SAS) (Rillieux-La-pape, 69)**  
**Plan Climat-Energie Territorial in developing countries.**

ENERCAP is an Energy and Carbon Strategy Consulting firm based in Lyon, France. The mission of the company is to aid private and public entities to define, implement, and finance their energy and carbon strategies. The thesis focuses on the implementation of a Plan Climat-Energie territorial in developing countries. A review of the implementation method utilized in Europe -France- will be made as basis of comparison with different scenarios. Different strategies and modifications will be presented in order to obtain an interest from countries in development for the implementation of such methodologies. A complete description of the method will be presented as well.

16h20  
jury B



**Victor POMARICO UCHOA**  
**Amyris do Brazil SA (Campinas, Brazil)**  
**The Brazilian transportation energy sector: a review of the renewable alternatives to replace petroleum-sourced diesel.**

Brazil has proudly decreased its dependence on petroleum-sourced fuels in the last decade, reinforcing biofuel mandates and encouraging flex fueled passenger cars. Nevertheless, Brazil still highly depends on fossil diesel for commercial vehicles, lacking infra-structure to meet the internal demand. The public transportation sector in the main metropolitan areas, increasingly under pressure for cleaner and renewable fuels, contributed in 2010 for the import of approximately 2.6 billion liters of low sulfur diesel.

The thesis focuses on a comprehensive assessment of the different renewable fuels as alternatives to replace petroleum-sourced diesel in Brazil, in light of the drivers of diesel market dynamics in Brazil. The study encompasses a comparison of environmental benefits of the available solutions, readiness for implementation into the Brazilian market, land use efficiency, economical impacts on the value chain and regulatory challenges to deal with.

About Amyris: a company providing renewable products by applying industrial synthetic biology producing defined molecules for use as renewable chemicals and transportation fuels. In this study, the "Diesel de Cana™", the Amyris' sugar-to-diesel hydrocarbon fuel, is evaluated as a complementary solution within the transportation energy matrix in Brazil.

8h  
jury A



**Flavio MATOS**  
**CNIM Environnement (75 Paris, France)**

**Development and implementation of a technical and financial model for the pre-feasibility analysis of Waste-to-Energy projects.**



The CNIM Group designs and produces turnkey industrial solutions with high technological content and offers research and expertise services in the sectors of Environment, Energy and Innovation & Systems. It is present in 21 countries and counts with over 3500 employees. The Environment Division of the Group is one of the major European specialists in waste-to-energy conversion and provides design, construction, commissioning, operation and maintenance of WtE plants.

The group is continuously extending its commercial efforts to international markets, and one of the main difficulties faced during each prospection phase is in quickly advising the municipalities with respect to the tipping fee that must be implemented. In order to do so a thorough technical and economical analysis must be performed, thus requiring the deployment of significant internal resources to get each study accomplished.

In this context, the thesis project aims at developing a technical and economical model for the pre-feasibility analysis of waste-to-energy plants, with further validation of the tool in ongoing projects. The project will be developed together with the commercial director's team and through interaction with Technical, O&M, Budgeting and Financial departments, while tasks that require management and technical skills related to the Environment and Energy sectors will be undertaken.

8h  
jury B



**Alicia OFFUTT**  
**Quantis (Paris, 75)**

**A consistent framework and applicable inventory for water footprinting.**



Quantis is a LCA consultancy firm that offers a range of solutions for organizations through both consulting and business software and is also involved in numerous international water initiatives such as UNEP-SETAC, WFN, and CEO Water mandate.

As water is a growing concern in life cycle assessment and current inventory databases only provide limited data on water, Quantis is leading the development of a "Water DataBase" in collaboration with Ecoinvent, Danone, Kraft Foods, Molson Coors Brewing Company UK, Natura, Unilever PLC, Veolia Environnement, Steelcase, and L'Oréal. The project aims to create an extensive water database that can be used to perform water footprint analysis with a life cycle perspective of products and companies. Modifying and extending the current Ecoinvent database, the tasks under this project include developing a framework of water withdrawal and release, data collection and modeling of key processes of partner companies, as well as assisting in business development. Once completed, the database will be incorporated into next version of Ecoinvent.

9h10  
jury A



**Mohamad TARHINI**  
**European Investment Bank (EIB) (Luxembourg)**

**Financing of Energy Efficiency and Small-scale Renewable Energy Projects in Urban Areas of the Southern and Eastern Mediterranean Region.**



The European Investment Bank (EIB) is the European Union's financing institution. Its role is to provide long-term finance in support of investment projects inside and outside the European Union. In the past few years, the EIB has considerably increased its lending for energy efficiency (EE), which doubled in 2009 to EUR 1.5bn and is expected to continue increasing in the future.

This master thesis focuses on the analysis of current project proposals in energy efficiency (EE) and small-scale renewable energy (RE) for the Mediterranean Partner Countries (MPCs). The general objectives are to assess the potentials of EE and small-scale RE projects in cities of the MPCs, review the institutional, regulatory and financial frameworks, develop a model to assess the capacity of the MPCs to meet their national EE targets and identify the associated barriers. The expected outcome of this study is a systematic assessment of the current status of EE & small-scale RE in the MPCs, covering past projects, as well as short-to-medium term proposals. This study will lay down the foundations to detailed feasibility studies for EE pilot programmes to be initiated by the EIB in the MPC region.

9h10  
jury B



**José Miguel GONZÁLEZ**  
**DAIS GLOBAL - SIALSOL (Santiago, Chile & Madrid, España)**  
**Business Development for Latin America.**



DAIS Global is a born global company founded by an international group of ME3 energy and environmental professionals. It was conceived to provide a reliable platform facilitating technology and knowledge trading and transfer within its established worldwide network. During 2010, DAIS Global established a partnership with SIALSOL, a Spanish solar energy company with vast local experience in the development of solar PV and CSP installations.

The thesis covers the first steps in the internationalization process of SIALSOL towards the Latin American market through the DAIS Global platform. Chile was strategically selected as the first target for business development. The project includes local strategic analysis & corporate strategy development, the institution of local sales & marketing channels, the international sourcing of primary equipments and, finally, the preparation of commercial proposals.

10h30  
jury A



**Jarett GOLDSMITH**  
**Tecniaia- Research & Innovation (Derio, Spain)**  
**Technical & Economic Investigation of Floating Offshore Wind Energy.**



Tecniaia is a large technological corporation which arose from the Basque business environment in northern Spain and is focused on research and innovation in 20 different business units. Within the Energy unit, the Marine Energy (Energías Marinas) department states that one of their primary objectives is to “develop innovative solutions for floating offshore wind turbines which are technically and economically feasible.”

In support of that objective, this thesis examines the technical and economic potential of wind farms in deep-water sites, comprised of turbines supported by floating platforms. Research into the state-of-the-art for floating wind platforms is a critical for understanding the characteristics and requirements of these technologies. A primary goal is then to categorize all of the major contributors to overall project cost and to use this information to develop financial worksheets and methodologies which can be applied to a given hypothetical or potential floating wind farm in order to help analyze the economic feasibility of a project.

Tecniaia is also interested in the design and development of floating offshore wind platforms. Therefore, preliminary investigation into the conceptual design of a selected idea is also carried out in this thesis. As time permits, the following aspects of floating wind platform design are examined: overall platform geometry and configuration, patent searches, specification of conditions/constraints, weight and load breakdowns, force analysis, global sizing, hydrostatics and stability, hydrodynamics, scantling and global structural strength, and mooring considerations.

10h30  
jury B



**Nino LAKSMONO**  
**Ecole des Mines de Nantes (Nantes, 44, France)**  
**Valorization of Tar from Biomass Gasification as a Fuel for Internal Combustion Engine.**



Biomass is a renewable resource whose utilization has received great attention due to environmental considerations and the increasing demands of energy worldwide. Amongst biomass utilization technologies, biomass gasification has been considered as one of the most promising technology in the future for heat and power generation. However, the presence of tars as byproduct has been considered the “bottleneck” of gasification process. The cleaning and disposal of tar not only represent an environmental problem but also impose an additional cost to the industry. For this reason, a study on biomass tar valorization technology is conducted at Ecole des Mines de Nantes – Department of Energy System and Environment, with an objective to evaluate the feasibility of tar utilization as a fuel for internal combustion engines. The scope of work of the project is divided into 5 phases: [1] State of the art technology review and identification, [2] Characterization of tars from the gasification process/pyrolysis, [3] Experimental work on fuel production [4] Characterization of fuel and engine test (emission and performance) [5] Technical report and evaluation. The outcome of this work is expected to provide solution on waste utilization as well as alternative fuel production.

11h40  
jury A



**Olynda CUMPIAN**  
**Gas Natural Fenosa (Madrid, Spain)**

**Position and Strategic Analysis: Main Power Generation Technologies and Players in Europe.**



Gas Natural Fenosa is one of the leading multinational companies in the gas and electricity sector, operating in 25 countries, with more than 20 million customers and 16,500 MW of installed capacity. It is the largest integrated gas and electricity company in Spain and Latin America, leading the natural gas sales market in the Iberian Peninsula, and the number one distributor of natural gas in Latin America. Gas Natural Fenosa has integrated the gas and electricity businesses in a single company with extensive experience in the energy sector, capable of competing efficiently in energy markets subject to a process of increasing integration, globalization and levels of competition.

This position and strategic analysis project explores the current and expected investing trends in the European power sector, monitoring the main players and technologies under certain countries. This analysis will answer the questions: Which are the winning technologies for new investments? What is the role of the new entrants? What is the role of the historic/incumbent companies? Regarding the energy sector: Which markets are the most desirable for investment by new entrants? What are current and expected trends of Combined Cycle Gas Turbines (CCGT)?

14h  
jury A



**Victoria NJUKI**  
**GE Energy Europe (Belfort, 90, France)**

**Business Case Development for the Integration of Energy Storage on a Power Plant.**



GE Energy is a leading global provider of energy technologies in all sectors of the energy industry including coal, oil, natural gas, nuclear energy, renewable energy sources such as wind, solar and biogas; and other alternative fuels. The European headquarters for GE Energy are located in Belfort, France with 2000 employees who design and install power generation plants that are cleaner, more efficient and more economical. They are the only manufacturers of gas turbines of medium and high power in France.

The objective of this project is to develop a business case for the integration of high capacity energy storage on a power plant. It will cover the review of energy storage technologies, the identification of opportunities for energy storage integration on a power plant, a financial analysis of the costs and benefits associated with the inclusion of energy storage and an investigation of the legal, environmental and social framework that would affect the use of this technology.

14h  
jury B



**María GARCÍA ALÍA**  
**Deltares, Soil and Urban Groundwater Department (Utrecht, The Netherlands)**

**Development of a Holistic Brownfield Management Strategy and improvement of In Situ Soil Remediation Techniques.**



Deltares is an international operating, Dutch-based, independent research institute and specialist consultancy for matters relating to water, soil and the subsurface.

The thesis involves two R+D European projects included in the 7th Framework Program, related to land management and soil remediation:

- HOListic Management of Brownfield REgeneration (HOMBRE)
- Sustainable Soil Upgrading by Developing Cost effective, Biogeochemical Remediation (UPSOIL).

HOMBRE seeks to convert brownfields, which are usually perceived as "lost" because of a costly and time consuming regeneration process, into valuable land through a holistic approach towards use of the resources present and the new circular land management concept. Archetype case studies are being selected to ensure the regeneration strategies, technologies and solutions developed are widely applicable. The case studies analysis includes the research of potential cases, the definition of detailed evaluation criteria, the selection process and the in depth analysis of the selected cases.

UPSOIL aims at the development of robust, fast, cost-effective In situ soil remediation technologies for the treatment of Total Petroleum Hydrocarbons (TPHs) and Chlorinated Volatile organic Hydrocarbons. Chemical oxidation experiments are being performed looking to maximize contaminant degradation and minimize soil quality degradation.

15h10  
jury A



**Georgio AKIKI**  
**AREVA Renewables (Paris, France)**

**Deploying Concentrated Solar Power Technology in the Middle East and North Africa - A business development approach.**



AREVA provides its customers with solutions for carbon-free power generation. As the global nuclear industry leader, AREVA's unique integrated offer to utilities covers every stage of the fuel cycle, reactor design and construction as well as related services.

AREVA Renewables adds value to the group's offer of CO2-free power generation by providing decentralized energy supply through wind, bioenergy, solar and hydrogen energy solutions. These turnkey solutions are designed to meet both short and long-term requirements while meeting energy demand in standard and peak consumption periods.

The thesis focuses on identifying barriers to entry for Concentrated Solar Power (CSP) technology in Middle East and North Africa (MENA) markets. Special consideration is given to the issue of financing, both in terms of initial project bankability (capital expenditure) as well as the production cost differential between solar thermal energy and the current energy mix of a country.

Actual projects in varying phases of development will be showcased to demonstrate the thesis findings.

15h10  
jury B



**Irwin IRNANDI**  
**Rekayasa Industri (Jakarta, Indonesia)**

**Analysis of Condensate Process Control in the design of Coal Fired Power Plant.**



PT Rekayasa Industri was established by the Government of the Republic of Indonesia on August 12, 1981 to develop national capabilities in engineering, procurement, construction and commissioning (EPCC) for large industrial plant into a world-class capability. The company's scope of EPCC business includes: Oil, Gas, Power, Geothermal, Refinery, Petrochemical, Mineral, Environmental, and Infrastructure, Project/Plant Feasibility Studies, as well as Plant Operation & Maintenance.

In a coal-fired power plant, the Condensate exhausted from the Steam Turbine, is discharged into the Condenser and collected in the Condenser hotwell. The condensate system shall recycle the condensate from the condenser hotwell back into the Boiler to make a complete water-steam cycle. The make-up water is needed due to water loss during the power plant operation and this lost must be replaced from an external make-up source, through make-up water system.

The main control of condensate system is the condensate level control system, which together with the make-up water control forms a control system which greatly influence the stability of steam power plant operation.

16h20  
jury A



**Federico HINRICHS**  
**Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Nairobi, Kenya)**  
**Pamoja Cleantech AB (Kampala, Uganda)**

**Business Development for Renewable Energy in East Africa.**



This master thesis project was carried out within two different organisations, but with complementary scopes and objectives. Within GIZ in Kenya, I have worked for the development of the solar PV market. PV technology is already competitive in off-grid applications and due to high electricity prices in Kenya and favourable local conditions it has already achieved grid parity. My tasks have ranged from assessing the feasibility of PV systems in specific off-grid sites to gathering relevant arguments to promote policy changes for the grid-connection of small-scale systems.

Pamoja is a young Swedish-Ugandan start-up. They are developing a modular biomass gasification plant with the aim of providing electricity to rural communities in East Africa. My mission has been to identify suitable business models, enabling policies, support mechanisms and financial resources for the successful penetration of Pamoja in the rural electrification market in Uganda.

Working in these two different projects has given me a good overview of the potential and constraints of small scale renewable energy systems in the region. Different strategies are discussed, case studies are presented addressing technical, financial and political aspects and the conclusions provide some recommendations for the prosperity of renewable energy businesses in East Africa.

16h20  
jury B



**Mehmet AKBAY**  
**Istanbul Technical University**

**Comparative analysis for energy production processes.**



Istanbul Technical University is strongly identified with architectural and engineering education in Turkey with a history stretching back over 236 years, providing technical education within a modern educational environment and strong academic staff.

The thesis focuses on to identify a priority schedule within the framework of the global environment and energy policies to assist decision-makers in the selection of energy production processes options. Main goal is to incorporate the prioritization criteria for the assessment of various energy policies for power alternatives, and evaluating these policies against these criteria.

The project also includes to systemize environmental decisions made by environmental risk assessment, environmental impact assessment and subsequently environmental management system and to establish a framework to reduce these risks that are characterized by environmental risk assessment.