

THE EXECUTIVE ENERGY MANAGEMENT DEVELOPMENT PROGRAM (EMDP)

The EMDP is a tailor-made program that offers participants and companies the advantage of flexibility, by clustering seminars according to the organization's training needs.

The International Executive Education Team, in collaboration with the partner organization, will design a customized program by selecting:

✓ **The location**

HEC Montréal professors can give their seminar in any international location or in the high-tech facilities of HEC Montréal.

✓ **The language**

All seminars are available in English, French or with simultaneous translation into any other language.

✓ **The structure**

A variety of seminars and topics can be chosen from our extensive selection.

✓ **The format**

For example, each topic can be offered as a two- or three-day seminar. Seminars held in Montreal can be combined with complementary industrial visits or conferences by experts from leading energy organizations.

Our executive seminars are intended for middle and senior managers working for oil, gas and electricity companies in the public and private sectors. The main objective of the program is to prepare participants for greater responsibilities by ensuring that they master key management concepts and develop leadership skills.

All seminars combine theory and practice to ensure students gain a broad view of key issues in the energy sector, together with the analytical tools that facilitate decision making. Upon completion of the EMDP, participants will have acquired general and specific theoretical and practical concepts that underlie the administration of today's energy firm, ranging from management skills to the development of operational and investment plans and strategies.

EMDP participants will receive a certificate from HEC Montréal.

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SEMINARS

MANAGEMENT SKILLS FOR THE ENERGY SECTOR

Introductory Management

Value creation requires the mastery of techniques and understanding the logic that characterizes both specialized and general management. The key is the ability to integrate multiple activities that have different logics. Strategy is the concept instrument by which this is achieved. The practice of strategy making is critical to a firms' success. This seminar allows participants to take part in strategic management simulations or real-life cases that present the full range of business decision making, thereby providing an opportunity to acquire a well-rounded view of the firm and its functions. Theoretical principles are applied in a more hands-on manner. The seminar helps participants understand and experience the impact and strategic implications of the decisions they make, when the perspective of the whole firm is considered. Also, given the international competitive context, participants will also experience the challenges of making decisions when faced with uncertainty.

Corporate Management

The seminar focuses on the issues of strategy-based management. The main trends that have historically influenced management concepts as well as emerging trends will be covered. Sessions will help participants develop a broad perspective on business dynamics and help them better understand issues related to managing an organization. Important issues, such as the nature of organization, the manager's roles, introduction to strategy, in certain strategy formulation and elements of strategy implementation will provide a springboard for class discussion.

Organizational Structure and Management Systems for most Electricity Firms

Organizations enable a group of people to effectively coordinate their efforts and get things done. The structure of an organization is the pattern of organizational roles, relationships and processes that permit a wide variety of functions to be accomplished. Organizational structure enables coordination among members and defines the boundaries within the organization and its relationships with others in the external environment. Effectively structuring an organization is essential in achieving its strategic and operational goals: understanding organizational structuring is a critical part of being an effective manager.

This seminar exposes participants to the key concepts and challenges of organizational structure and management systems.

Specific topics in this seminar include:

- Different types of organizational structures (functional, divisional, matrix, networked);
- Management systems that support the organizational structure (including how groups work together, solve problems, gather information and make decisions);

- Relationships and communications of organizational members with one another (including between headquarters and subsidiary operations); and
- Role of managers in making the organizational structure effective both operationally and strategically.

The seminar focuses particularly on organizational structures and management systems pertinent to and used in electricity firms. It draws on examples and experience in electricity firms operating in different countries and using different production technologies.

This seminar introduces participants to key concepts in organizational structure and management systems using a combination of lectures, cases, and practical exercises. It emphasizes practical knowledge, discussion, and active learning.

Strategic Management in the Energy Industry

This course is designed to provide an advanced discussion forum for managers who have been exposed to strategic thinking either in practice or in other courses. The course is divided into three parts. The first deals with the functions that executives are faced with in today's large and complex firms. The second reviews the important strategy analysis necessary in all strategic management decisions. Finally, the third part deals with strategy in complex situations, when both objectives and cause-effect relationships are unclear. The course is taught through the case method. To facilitate learning, cases (written or filmed) adapted to the participants' realities are generally used.

Business and Corporate Governance

All business organizations have two interconnected perspectives: Business and Corporate Governance. Business Governance involves the responsibilities and activities of the executive leadership of the firm. These leaders guide and manage the organization to conform to the mandate, strategy, objectives, and expected operating results. The focus of this perspective involves efficiency, performance, and productivity. Corporate Governance, on the other hand, involves monitoring and control by the board on behalf of a range of internal and external stakeholders. The focus of this perspective involves legal responsibilities to ensure the ongoing well-being and reputation of the firm. These two perspectives are complementary and influence executive and organizational decision-making. This seminar helps participants understand the complexity and paradox of leading and managing for responsibility and effectiveness: Business and Corporate Governance.

Change Management

This seminar on managing change deals specifically with the implementation of major strategic organizational changes. It aims at providing participants with the necessary framework and tools to assess, plan, and more effectively lead organizational changes within their organization. Special

attention is placed on the human side of change and how to best plan for and manage change accordingly.

The seminar has three objectives: first, to understand the nature of strategic changes and the challenges inherent in managing these changes; second, to discuss approaches to planning, managing and leading strategic change; third, to review the factors that may hinder the implementation of change in an organization, including the concepts of the organization's "capacity to change" and the typical phases of concerns of individuals impacted by any change (often labeled as "resistance" to change).

Managerial Economics

This seminar is intended to enable managers to understand the economic framework in which they operate. The ultimate objective is to improve decision making among managers through the analysis of microeconomic behavior. In particular, the aim is to teach managers to analyze the decisions of economic agents and make predictions on the outcomes of these decisions and on how these outcomes are affected by the economic environment. This seminar introduces the participants to the economic tools needed to understand the functioning of market economies in general and the workings of the energy sector. Various market structures are analyzed with reference to the energy sector. Different pricing strategies are discussed. Energy policies are examined based on concepts developed in the seminar.

Supply Chain Management in the Energy Sector

The seminar will present and review the major characteristics of Supply Chain Management and its importance from a cost efficiency perspective as well as from a source of competitive strength for organizations. In a global context, the seminar will introduce the major trends and best practices associated with strategic supply chain management and illustrate these concepts with examples taken from real life experiences. The topics covered include sourcing and supply management (buyer-supplier relationship, supplier selection and evaluation), inventory management (inventory costs, risk pooling, safety stocks), major issues in domestic and international freight transportation (the use of third party providers (3PLs)) and specific topic like postponement strategies, the use of value-added distribution centers, and integration mechanisms in the supply chain.

Decision Support Tools

The complexity of management situations may require the help of specific software. This seminar presents the field of management science that proposes computer tools to guide management decisions.

This seminar introduces various decision support models to help energy managers address concrete situations related to economics, finance, human resources, logistics, marketing, production and the management of complex projects. It also presents tools that take uncertainty

in the decision-making process into account and prepares one to deal with conflicting objectives that may arise in a sustainable development context (such as the need to increase profit and to reduce environmental impacts simultaneously).

Marketing Energy Products

Energy companies around the world are facing new challenges related to total or partial deregulation of production, transmission, and distribution activities. The constantly evolving environment of the energy industry has engendered marketing related knowledge that has proven to be very useful for many companies. Understanding the market in which it evolves, is central to the marketing function. Equally critical is the identification of customers' needs creating the demand for energy products or services. The company can then formulate strategies and tactics that will increase satisfaction while maintaining its corporate objectives without only looking at the supply side of the market. Nowadays the marketing function plays a vital role in proposing energy marketing products, programs and services that reflect the increasing integration of the regulator's and government's will to promote sustainable development. When paired with smart metering integration, this can impact the decision-making process of the entire industry.

Management Accounting

The objective of management accounting is to help managers achieve the missions and strategies established for their enterprise. It is a branch of accounting that provides financial and non-financial information to support managerial decisions. A key role for management accountants is to establish the control systems used to achieve organizational goals and minimize risks. One of the most important roles is budgetary control, a powerful tool that encourages planning, sets milestones, evaluates performance, and suggests paths for improvement. Management accountants also develop information systems that communicate strategic and operational priorities to managerial decision makers.

The objective of this course is to help participants better understand the role and functioning of budget control and to situate it within the larger context of management control.

Strategic Performance Management – Developing Key Performance Indicators (KPI)

This seminar is intended to equip participants with the necessary skills to implement the fundamental steps in performance management deployment. First, we explore how organizational strategy is deployed through the operations. We present analytical tools and models to clearly measure expected outcomes, and the competitive advantages that must be harnessed and defended. The objective of the first part of this course is to clearly understand how operational decisions develop and consolidate competitive advantages while allowing the managers to effectively respond to the expectations of their clients and partners.

The second part proposes a performance management framework that translates the strategic orientations into the level of daily operations. The balanced scorecard framework is presented. We begin by introducing strategic maps that can serve to identify management priorities on all dimensions of value creation and clarify their logical sequence. We also present the principles and practices of planning, with an emphasis on formulating objectives and measuring performance. This allows for identifying and tracking management concerns. Best practices in monitoring and performance management are then proposed.

This teaching approach exposes participants to a continuous knowledge transfer. The proposed analytical and implementation tools are tested in small group discussions. Participants are invited to enrich the seminar by sharing their experiences within the context and processes of their own business units. This allows for gaining knowledge that is highly personalized.

Human Resource Management

The underlying premise of this course is that human resources are a major, if not the most important source of a firm's competitive advantage in the new economy. Managers are increasingly realizing that the skills of employees, coupled with their ability to innovate and adapt, constitute key assets for the organization in today's turbulent economic environment. Consequently, managers are turning their attention to human resource (HR) issues. This course offers a framework for thinking strategically about managing human resources. To better meet the needs of managers, the seminar adopts the perspective of a top manager, which goes beyond the narrower, more operational concerns of the HR manager.

Specifically, this course examines the types of institutions that are established to regulate the employment relationship, the firm's human resource management models, the strategy implemented by managers to develop high performance work systems and the factors that hinder or facilitate the diffusion of these systems. Illustrations of successful HR strategies will be presented and discussed.

Strategic Human Performance Management

This seminar is intended to equip participants by studying the appropriate conditions to ensure a successful performance management program.

Participants, first need to share vocabulary and a common basis, as well as define manager's roles and responsibilities to be better supported by human resources professionals. They also need to look at the components of a performance management program. First, we distinguish notions such as performance, competency, potential, KPI and balanced scorecard. Then we explain the distinction between Performance Management at the organizational and individual level. We identify the targeted population for performance management programs. Finally, we define the importance and the roles and responsibilities of the different actors involved in a performance management process.

- The second part proposes to identify and qualify appropriate criteria, distinguish, and select adequate evaluation methods, define common errors, and identify ways to reduce them and to look at performance appraisal forms. We will also investigate how other human resources practices support performance management programs.
- The objective of the third part is to clearly define the manager's roles, responsibilities and competencies required to manage the performance process. From a manager's perspective, their responsibilities include having to clarify their expectations, delegating tasks and responsibilities, giving positive and constructive feedback, ensuring follow-up, and holding the annual performance meeting.

In conclusion, in this program we underline the characteristics of a performance-enhancing culture and the rules found in such an organization, align a performance management program to organizational strategy and encourage ethical behaviors in day-to-day performance management.

Talent Management: a Process to Achieve Business Objectives through People

The best business strategy is useless if you don't have the right people to execute it! Therefore, most successful organizations have made "Talent Management" one of their top priorities. Talent Management must be an integrated part of the business process and should be implemented at every level of the organization.

This seminar will provide participants with practical tools to identify, develop and retain a pool of talented, well-trained people to meet current and future business challenges. It will help participants understand how individual performance assessment, training and development activities and succession planning drive the talent management process.

Through the process of performance management, training and development, the manager or supervisor of this process will recognize his responsibility and will be better positioned to coach his employees.

Management Simulation: Globstrat

This course is built around a realistic internet-based simulation. It is designed to introduce participants to the basic managerial issues facing businesses, in both the private and the public sectors, at the beginning of the 21st century. The course bypasses the traditional management framework, such as the Planning, Organizing, Directing, Controlling framework developed by people such as Fayol at the dawn of this century. Rather, it focuses on the important issues of strategy-based management. Simple technical issues such as planning will also be addressed during the simulation.

The important knowledge, skills and attitudes that will be targeted in this course are intended to help participants:



- Develop a broad perspective on business dynamics and gain a better understanding of issues related to managing an organization.
- Understand the issues related to coordinating and integrating the various activities of an organization.
- Experience, through decision-making, both the specific contributions and the interdependencies of the various functions within the firm;
- Practice the actual business of managing. Through a complex business simulation, teams will assume and share consistent decision making to win in the short run and benefit in the long run.

CHALLENGES OF THE ENERGY SECTOR

Regulatory and Tariff Design Issues in the Context of Energy Transitions

The objectives of this training are to know the major regulatory issues concerning new energy business models, to know the basic economic, legal and political motivations behind the classic energy business model and to understand the new regulatory challenges and tariffs for a successful energy transition. The seminar will cover the following topics:

- Traditional business models versus emerging business models in the energy sector;
- The use of energy and access as a public service;
- Public interest and emerging technologies;
- Questions related to the revenue required from electricity carriers and distributors;
- Efficiency and fair and reasonable prices for electricity consumption and access;
- Accountability for alternative public service solutions;
- Cost recovery compared to social and environmental engineering solutions.

New Energy Sector: a Worldwide Perspective

The purpose of this seminar is to present the trends in the energy sector and analyze the way countries and companies react to these trends. The seminar deals with energy balances and the main indicators linked to energy performance and the environment. The development of the primary sources of energy, energy consumption, and trends in various parts of the world are covered. Structural adjustments caused by technological changes, the new competitive environment and increasing GHG constraints are also covered.

More specifically, the seminar looks at structural changes that have taken place in the competitive environment of the power and hydrocarbon industries. It covers special topics such as renewable energy, distributed generation and smart grids, unconventional oil and gas sources and LNG developments. A focus on carbon markets and GHG constraints is also present, as the energy sector is increasingly linked to climate policies.

The objective of this seminar is to help participants better understand key energy issues being discussed around the world, by providing them with the key knowledge and data.

Energy Regulation and Law

The deregulation of energy industries did not lead to an absence of regulation but rather to new forms of regulation. The objective of this seminar is to provide a better understanding of the issues surrounding energy regulation. The seminar begins by presenting the tools and trends in energy regulation. It addresses the question of natural monopolies and other market failures and explains the rationale for government intervention, the use of regulation and the specific role of regulatory agencies in market economies. It critically examines and presents the various economic and financial approaches used in regulation today, and their effects. International comparisons and best practices are used to illustrate the advantages and disadvantages of each model of regulation. The concepts of cost of service and rate base determination, optimal capital structure,

business risks, regulated versus non-regulated activities, transfer pricing and project authorization are explained in detail and applied to real world situations. The determination of a fair return on equity using various methodologies is also presented. Finally, new trends in energy regulation, including performance-based and yardstick regulation are addressed and explained. Practical examples and case studies about transmission and distribution and the regulatory mechanisms used to provide incentives for the deployment of merchant lines are also examined. As well, regulatory issues related to the interconnection and creation of regional electricity markets and the environment are presented.

- Law and regulation (Legal aspects of regulation under restructured energy systems),
- Economic and Financial Principles of Regulation (Why and how to regulate under restructured energy systems),
- Economic Models of Regulation - Incentive mechanisms (Economic regulation in practice - evaluation tools of the impact of regulation on industry, consumers, government and other stakeholders, presentation of case studies and practical international examples demonstrating the real effects of reforms),
- Financial Models of Regulation (Use of Models to determine the "just rate of return" and the links between cost of capital and electricity prices, functioning of the wholesale markets and pricing mechanisms, competition issues in restructured markets).

Environment Management and Sustainable Development

This seminar is divided into three main parts. First, students gain insight into the main environmental problems caused by energy production and consumption and their consequences, as well as recent trends in this area. Second, the links between the economy and the environment are explored from a macro and a microeconomic perspective. The particular focus is on the concept of externality and the need for state intervention. Different types of government interventions are analyzed, ranging from regulation, taxes, and pollution rights to subsidies, together with their impact on enterprises. Third, management of the environment within the firm is discussed. We see how environmental issues can be integrated into the firm's strategy and how the ISO 14000 certification can serve as a basis for developing an environmental management system (EMS). Case studies provide illustrations.

Renewable Energy Integration into Electricity Markets: A Non-Technical Approach

From a strictly technical aspect, producing, transporting, storing and different ways of integrating renewable energy (RE) technologies from wind or solar, often called "variable generation", are more and more understood by specialists in the electricity sector around the world, this session will not focus on these technical issues but rather more on the challenges energy companies are facing with understanding the market environment they are in. Today, more than ever, the classic business model used for decades, derived from integrated electric companies, is evolving while creating internal misunderstanding among company's employees working in these "new" electricity market environment changes that needs to be better understood. This session focuses

on markets best practice for incorporating renewable energy, distributed generation, energy storage, proper use of more “stable” generation (thermally activated or hydro technologies), and demand response into the electric distribution and transmission system. First, a market theory study approach is being used to balance cost recovery risk for electric company’s while promoting better integration development and demonstrations, regulatory need, better rate design, and lowering institutional barriers for using renewable and distributed systems. Second, participants will compare different market solutions that are being discussed and/or implemented in North America and Europe. Finally, participants will use what is being attempted around the world to explore some solutions that could be adapted for the participants company’s own market environment.

The goal of this session is to help participants better understand “up-to-date” issues being discussed around the world with integrating renewable energy from a non-technical perspective.

More specifically, participants will:

- Explore economic, finance, regulatory, rate design and cross-jurisdiction marketing issues related to the need to integrate RE;
- Compare North American and European electricity markets solutions that are being discussed and implemented for better RE usage;
- Discuss possible regulatory and rate design options that could be adapted for the company’s own environment and reality.

Social, Environmental and Economic Issues

The hydro sector is at a crossroads. On the one hand, hydro, as a cleaner / carbon low impact source of energy, will be in demand to meet increasing energy needs in the 21st century. There is a wide consensus on the relevance and potential for hydro in the 21st century. On the other hand, several studies and reviews have highlighted the economic, social, and environmental limitations of several hydro projects. This questioning has increased the challenges related to building new dams. Specifically, the social license to design, build and operate hydro power has become a central issue for many companies. Several key industry players have developed new standards, procedures, and practices to address these issues. Therefore, there is an increasing recognition that “getting it right” in the integration of social, economic, and environmental dimensions of dams is a necessary condition for hydro power operations.

This seminar will focus on current social and environmental issues in the Hydro sector. It accomplishes this by building on an understanding of the diversity of various settings. It aims to learn from relevant experiences of hydro power design, construction, and exploitation so as to reflect on current practices and envision possibilities. Through this seminar, participants will (1) develop an awareness of key social and environmental issues related to hydro development and exploitation in a global context; (2) gain a deeper understanding of work and processes related to successful management of social, environmental, and economic issues; (3) be exposed to existing global social and environmental standards and frameworks; and (4) become more aware of the relevance of their own skills in addressing these challenges.

The pedagogy is based on in-depth / documented case studies on the degrees and forms of integration of social, environmental, and economic dimensions in hydro power design, construction, and exploitation. The seminar is based on the active involvement from the participants and during in-class discussions. Participants are exposed to relevant frameworks and are invited to apply these frameworks to the case studies and discussions.

Management of Transportation Systems

This seminar has two objectives: (1) introduces participants to the quantitative analysis tools used in management of energy transportation systems. Emphasis is placed on optimizing networks using specialized software to solve specific problems. Attention is paid to analysis and interpretation of results as well as technical aspects. (2) presents economic and operational aspects of the transportation systems of energy. The presentation focuses on the shipping of oil products and refining, pipeline networks and electricity transmission.

Optimal Management of Production Systems

The complexity of production management may require the help of specific software. This seminar introduces several advanced concepts in management science that proposes specific computer tools to orient the management of energy production systems.

This seminar presents specific decision support models pertaining to concrete management situations arising in production and other segments within the energy sector. Cases are looked at from two levels: 1) the energy firm where issues such as energy procurement, production and trading by the firm are examined and 2) the whole energy sector where issues such as planning, and regulation are investigated.

Smart Grid for Managers and Technical Leaders

This three-day seminar examines electrical network modernization, development of a Smart Grid aimed at improving energy consumption, asset management, network reliability, as well as enabling the integration of more renewable energies and electric cars. This training is intended for Managers and Technical Leaders of electrical and energy efficiency businesses. The seminar will be divided in six half-day sessions, each aiming to develop knowledge and skills.

The introductory session will outline the general presentation of the electrical network modernization project called “Smart Grid”. The project’s origins, its finality, the issues, and a review of several initiatives in this area will be presented. The second session will focus on the impact of the Smart Grid on business processes of electrical distribution and on transmission utilities. Special detail will be provided on planning, network operation, and maintenance. Measurement, procurement, and implementation of energy efficiency programs will also be addressed. A review of the different components of the Smart Grid will be presented during the third session. Demand and peak management, advanced metering, network automation, monitoring of on-line equipment, Volt and var controls, among other technologies, will be

presented. Technical notions will be explained, allowing Managers and Technical Leaders to understand the outcome of new applications, choose and prioritize the components to be deployed on the network or on the customers' premises. Case studies will allow participants to assess the cost and benefits of these components. The fourth session will cover the technical challenges raised by the Smart Grid, as well as standards, knowledge gaps, new equipment and software being developed to ensure network operability, and harvesting benefits from these new applications. The fifth session will be focused on new market trends and laws being established to enable Smart Grid development. It will also look at the emerging new actors, the evolution of the regulatory framework and the companies' business model. The last session will center on current best practice studies in this area and answer questions from participants.

Energy Planning and Demand Forecasting

This seminar covers topics in energy planning and forecasting. The main objective is to introduce participants to the principal challenges faced by various countries relative to the energy sector. The extent of these challenges differs according to a country's level of development, basic energy resources and general stance on state intervention. Specifically, we will cover the information system required to monitor the energy sector, the relation of energy consumption to demographic and macro-economic variables and the determinants of energy consumption. The last section of the course covers energy forecasting models.

Interconnection and Integration of Electricity Markets

All around the world, reforms in the electricity sector are going beyond simply introducing competition. They are also promoting greater interconnection among countries to encourage more efficient electricity production on a global scale. For instance, regulators in the European Union and North America are obliging members to open up their markets more to electricity exports and imports. The different regions of Africa are following suit, with ambitious plans for regional integration. They are applying the South African Power Pool model, introduced in 1995, with 12 member countries. The Power Pool project initiated by the Economic Community of West African States is well underway: memoranda of agreement to found the Pool have been signed, new regulatory institutions have been created and international interconnection projects funded by the World Bank and other financial backers have been implemented. This module on the integration of electricity markets covers the theoretical aspects of integration (principles and expected benefits) and possible mechanisms for its practical implementation (different types of power pools). There will also be a discussion on the specific challenges of integration in particular contexts, when participants can combine their expertise and identify the most promising institutional approaches to guarantee the success of such integration efforts.

Electricity Market: Mastering Competition through a Simulation

During the past twenty years, the energy sectors of many countries have gone through major changes. A large portion of these countries decided to unbundle their vertically integrated national utilities (i.e., the break-up between generation, transmission and distribution and

supply). Others, influenced by various drivers, decided to liberalize entry in the generation and supply parts of the industry by introducing competition. In parallel, other countries still have parts if not their entire energy industry privatized. This seminar focuses on competition and strategic behavior. These concepts are important in helping participants understand how the market price is derived, often at a higher level than the marginal cost of producing electricity. Strategic behavior is complex and subject to numerous factors such as market organizations, demand and engineering factors. To better understand market prices, its creation and strategic behaviour, this seminar presents a teaching tool developed to understand electricity market operations and supply bidding in a simulated market with a simple market clearing mechanism. This game will allow participants to evolve in an environment where they will not only make trading decisions, but also investment decisions.

Through this simulation and analysis of results, participants will gain essential strategic skills necessary to operate in competitive electricity markets.

Worldwide experiences in competitive electricity markets will also be discussed, and an introduction to transmission pricing and transmission congestion rights will be presented.

Carbon Markets and the Climate Change Challenge

The world climate is changing – with increased observations of extreme weather events, warmer and more extreme temperatures, rising sea levels, among other impacts, including on rainfalls. The international scientific community, through the International Panel on Climate Change (IPCC), agrees that historical greenhouse gases emissions (mostly CO₂, CH₄ and N₂O) from human societies have played a key role in climate change. Future emissions, especially from the energy sector which is the most important source of CO₂ (carbon dioxide) emissions and an important one of CH₄ (methane), can significantly alter the future climate of the Earth. Human societies may not be able to enjoy similar ecosystem services to the ones they have historically benefited from due to disruptions in ecosystems, caused by such evolution of the climate.

This seminar covers the background on climate change to understand its implications. Greenhouse gases emissions from the world are then studied, from a country and sector perspective, to gain insights on the difficulty to change historical emissions paths. The justification of carbon markets and its alternatives is explored, with a focus on recent ambitious initiatives, notably the California-Quebec cap-and-trade system. Finally, international aspects of carbon management are investigated: from local initiatives under Clean Development Mechanisms (CDM) to the geopolitical analysis of global climate negotiations and potential financial collapse of large hydrocarbon-based energy companies.

Shale Oil and Gas Revolution and its Implications to the Power Sector

Since 2008, the US oil and natural gas production started to increase after years of decline due to previously unanticipated commercially exploitable unconventional sources. Shale resources in key regions, dominated by Texas and North Dakota (for oil) and Pennsylvania, Ohio and again Texas (for natural gas), have been increasingly exploited. This led to much lower natural gas prices,

directly affecting electricity prices that have significantly decreased from their peak levels of the years 2006-2008. Similarly, oil prices in the US (and their benchmark price, the Western Texas Intermediate, WTI) have been lower than other prices, in particular the Brent oil price. The late 2014 steep drop in global oil prices can also be linked to the increasing US oil production. Indeed, the US joined Russia and Saudi Arabia in a close race to be the world top oil producer, with a production above 11 million barrels per day. Compared to China, the world 4th largest oil producer at about 4 million barrels per day and a 10% output growth since 2008, the US has seen its production grow by 47%.

This seminar will provide an in-depth coverage of this shale revolution and will allow participants to gain the appropriate understanding of this new energy situation. Implications for the power sector will be discussed, especially with respect to coal usage and renewable resources deployment.

We will describe the US situation in detail, with attention given to the environmental and social issues related to the shale resources exploitation. We will also cover international implications as well as the impact of this commercially new energy source on the power sector.

ENERGY PROJECTS: FINANCIAL AND ECONOMIC ANALYSIS

Economic Evaluation of Investment Projects

The main objective of this seminar is to understand the concepts and components behind a cost-benefit analysis. Through the notions of economic efficiency and consumer preferences, a framework is developed to measure the benefits and costs of a project for the producer, the consumer and society in general. Of particular importance is the presentation of evaluation techniques for cases where the market works perfectly, does not work perfectly, or does not exist at all. This seminar also covers the topics of discounting future benefits and costs, decision making and planning given uncertainties, the value of statistical lives and injuries, and the use of pilot projects.

Financial Analysis

This seminar covers the basic concepts of financial statement analysis using ratios, including the evaluation of performance, risk, and corporate liquidity. Concepts are illustrated through analyzing annual reports of energy companies. Special attention is attributed to the limited analysis based on accounting information and the use of the cash flow statement.

Project Financial Evaluation and Financing

The objective of the “Project Evaluation and Financing” module is to provide seminar participants with the necessary tools to assess whether a project is viable, and to familiarize them with the different available financing avenues. The seminar begins with an overview of the different techniques for evaluating the net value of a project including the pros and cons of each approach. The next step is to incorporate uncertainty into the evaluation framework and look at the different tools at our disposal for managing risk. The seminar will then concentrate on how to best structure a project, looking specifically at the different participants and their roles. Finally, the seminar will cover the different facets of project financing.

Risk Analysis

The seminar seeks to provide participants with the analytical tools used to make tactical and strategic decisions in an uncertain context. Participants will learn how to model uncertain decision problems, apply decision-making theory, and risk analysis, and use Monte-Carlo simulations and decision trees, thanks to specialized computer tools. Case studies will provide illustrations.

Financial Products

Companies working in the energy markets are exposed to significant fluctuations in the price of energy commodities (oil, gas, and electricity), which have a determining impact on their financial performance. This seminar's content integrates basic concepts and applications for the management (hedging) of energy price risks and using financial products such as futures/forwards, options, and swaps on energy commodities. The objectives of this seminar are:

- to present financial tools used in the energy sector;
- to outline the main concepts behind hedging strategies; and
- to illustrate the application of financial tools and possible hedging strategies in practical situations using energy derivatives in NYMEX (New York Mercantile Exchange).

International Capital Markets: Globalization and Transformation

The objective of this seminar is to explore how globalization and the constant transformations of technical and environmental conditions affect access of businesses and governments to international capital markets; to present the various actors, products, and markets, to analyze specific aspects of management and see the impact of regulation on the functioning of markets and the behavior of key agents.

This seminar covers the major segments of international capital markets, the main actors who inhabit it, the links to national markets and financing opportunities for businesses. It discusses the interbank market instruments, the relationship between interest rates and exchange rates, the elements and negotiation of an international bank lending, the impact of capital standards, the characteristics, and strengths at work on the various bond markets, the swap market and the international short-term instruments: Euro Commercial Paper and Euro notes and their role. In addition to the instruments, the main actors and intermediaries are presented.

ENERGY SEMINARS WITH PERSONALIZED CONTENT

HEC Montréal constantly develops tailor-made seminars to meet the training needs of our partners. Recently, we have offered seminars on the following topics:

- Effective Safety Management
- Dams Safety
- Dams and Rivers Management for Power Plant
- Crisis Management and Dealing with the Unexpected
- Power Plant Operations and Transmission Management
- Power Plant Optimization
- International Treaties and Agreements

We also have the capability of designing seminars on the following cutting-edge topics:

- Energy Efficiency Best Practices: Financing & Organizational Challenges
- Energy Data: Sources, Availability and Use
- Reliability Centered Maintenance (RCM)

In addition, we regularly organize field and industrial visits in conjunction with our seminars:

- Hydro-Québec Power Plants
- Hydro-Québec Research Institute (IREQ) and Electrium (electricity interpretation centre)
- Ontario's Independent Electricity System Operator
- Alberta's Oil Sands Exploitation

Do not hesitate to discuss your goals and expectations with us. We would be delighted to have a chance to explore new seminars that meet your needs.