



DEFINITION

Market Evolution Program Phase 1

Issue 1.0

*This document defines Phase 1 of the
Market Evolution Program's framework*

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Reference (Section and Paragraph)	Description of Change

1. Introduction

1.1 Document purpose and scope

This Project Definition Document (PDD) provides a framework for undertaking the first phase (January through June 2003) of the Market Evolution Program (MEP). In addition, it provides outline information on phase 2 (April through September 2003) which will be further detailed during phase 1. The document defines the scope and expectations of the MEP and provides the high level baseline for monitoring purposes throughout the life of the program to ensure that expectations are met.

The MEP consists of a group of initiatives that are designed to move forward the Ontario market over 2003/2004 and in particular implement features that will address the growing issue of resource adequacy. The initiatives are considered together for reasons of funding, initial resourcing and, above all, to ensure that they are developed in a consistent and efficient fashion.

This document should be agreed by all concerned parties at the start of the program, but should also be modified throughout the program (with agreement) if requirements or expectations change.

1.2 Who Should Use This Document

This document can be used by anyone who has an interest in the MEP, but has two primary audiences:

- The program steering committee – who should use it to ensure that the program meets expectations and to measure the program’s success.
- The program manager and project teams – who should use it to ensure that what is being delivered matches the expectations set out (and agreed) in this document.

– End of Section –

2. Program Charter

2.1 Program Statement

The MEP is to identify, recommend, design and deploy changes to the IMO-Administered Markets that meet the stated objectives of market evolution (Section 2.4.1) in a coordinated and controlled fashion.

The overall program will be deemed successful if:

- Implementations are on time and within budget
- The level of change is controlled and all change is authorised
- The success criteria for each project are specified in terms of their contribution towards customer satisfaction, through greater resource adequacy, more consistent price signals, improved price certainty and empathy with SMD; and these criteria are met.

Phase 1 of the MEP is to determine the feasibility of implementing the identified initiatives (Section 2.4.2) and make recommendations on whether and in what form the initiative should proceed. This phase is to be completed by April 2003 for all options except Locational Marginal Pricing, which will be completed by June 2003. The budget for phase 1 is \$1,085k. Phase 1 of the program will be considered successful if, within the above timescales:

- A decision is made on the future of every initiative;
- All deliverables are produced;
- Projects to deliver each initiative can commence immediately after an IMO Board decision (subject only to resource availability); and
- Stakeholder input is sought and acted upon during the analysis of each initiative.

Phase 2 of the MEP is to undertake the detailed design (market rules, procedures, systems) and implementation planning for each recommended initiative/project. The target timescale for completion of phase 2 is September 2003 and the estimated costs estimated are \$6,300k (IMO 2003-2005 Business Plan). Phase 2 of the program will be considered successful if, within the above timescales:

- A decision made on the future of every project;
- All deliverables are produced;
- Each project can commence its next phase immediately after a decision is made; and
- Rate of change of requirements within the project as it progresses is less than 10%.

Timelines and costs for subsequent phases have not yet been estimated.

2.2 Rationale and Project Justification

Even as the wholesale market opened on May 1, 2002, there were known to be deferred features that could not be provided at inception. In addition, six months experience of operations by both participants and the IMO has identified further opportunities to enhance market effectiveness. The key rationale of the MEP is to take forward the analysis, design and implementation of these changes in a coordinated and consistent manner.

2.3 Impact Statement

The first two phases of the MEP will give participants a high level of certainty as to how the Ontario wholesale market will develop in the short term and over what time horizons. This will enable participants to plan their commercial strategies and, in some cases, their IT developments.

2.4 Project Objectives and Scope

2.4.1 Overall objectives of MEP

The proposed overall objectives for the MEP are as follows:

To develop the IMO-Administered Markets so as to improve price transparency and operational stability while ensuring reliability [This is a modification of the objective set out in the document “Straw-Plan for the Evolution of the Ontario Market Design” (IMO_PLN_0037)].

From this objective a number of sub-objectives can be identified:

- *To provide greater price transparency;*
- *To provide greater operational certainty ahead of real-time operations*
- *To promote greater resource adequacy through demand side response*
- *To promote greater resource adequacy through supply side initiatives*

To identify and develop options for improving the overall operation of the IMO-Administered and retail markets [such as options for reducing the prudential burden on LDCs or options to simplify the overall market settlement]

To meet new and existing legal and regulatory requirements [such as the introduction of environmental tracking]

In addition to these objectives there are also several key principles that the MEP will follow when developing specific elements. These are:

To develop the IMO-Administered Markets in a manner that, as far as possible, is consistent with the objectives and details of FERC’s Standard Market Design (SMD) [in particular, to enable seamless interfaces with the markets of New York ISO and the Mid-west ISO]

To favor existing solutions that are deployed elsewhere

To favor implementation options that provide for speed of implementation

To favor implementation options that are flexible and thus best able to adapt to regulatory and legislative changes [In particular options should not assume that the price caps recently announced by the Government represent a permanent status-quo.]

2.4.2 Objectives and scope of phase 1

Phase 1 constitutes the feasibility stage of the MEP. During the planning for the MEP a number of initiatives have been identified as contributing to the above overall objectives. During phase 1 the feasibility of each of these initiatives will be tested and recommendations made on whether and in what form the initiative should proceed. For each initiative that is recommended to proceed, a Project Definition Document (PDD) will be produced.

The initiatives that will be evaluated during phase 1 and how they relate to the overall objectives are shown in the following table. Further background is included at Appendix A.

	<i>To provide greater price transparency</i>	<i>To provide greater operational certainty ahead of real-time operations</i>	<i>To promote greater resource adequacy through demand side response</i>	<i>To promote greater resource adequacy through supply side initiatives</i>	<i>To identify and develop options for improving the overall operation of the IMO-Administered and retail markets</i>	<i>To meet new and existing legal and regulatory requirements</i>
Short term resource adequacy initiatives		✓	✓	✓		
Long term resource adequacy initiatives		✓	✓	✓		✓
Environmental information tracking					✓	✓
Wholesale/retail market settlement changes					✓	✓
Day ahead market	✓	✓	✓	✓	✓	
Multi-interval optimization	✓	✓		✓		
Locational marginal pricing	✓		✓	✓	✓	

Other initiatives such as the introduction of a long-term energy forward market will not be investigated further at this stage. The program will maintain a list of such additional initiatives and bring any that are newly identified to the attention of the Steering Group.

2.4.3 Objectives and scope of phase 2

Phase 2 constitutes the design phase of the MEP. During this phase the design (market rule changes, procedure changes and system requirements) and implementation planning for each recommended initiative/project will be completed.

2.5 Constraints, Assumptions & Risks

All deliverables and the conduct of projects to will be in accordance with IMO standards and architectures.

Market stakeholdering must achieve a genuine solicitation of views whilst maintaining scheduled progress.

The IMO has already undertaken some research and initial thinking in respect of each of the initiatives to be considered during phase 1. However, there is little documentation to act as reference and the most practical means in which to leverage work done to date is to speak to the “thought leaders” in each area, they are:

Peter Sergejewich	Resource adequacy and day ahead market
Kerry Noble	Day ahead market
Darren Finkbeiner	Locational marginal pricing
Amir Shalaby	Environmental information tracking
Derek Cowbourne	Wholesale/retail market settlement changes

2.6 Cost-Benefit Analysis

The cost benefit of Phase 1 depends on approval of the 2003-2005 IMO Business Plan; rate approval will be deemed to provide the justification to proceed.

For Phase 2, each project will be subject to a costs and benefits analysis before commencement.

– End of Section –

3. Updated Business Case

3.1 Updated Business Case

Please refer to *IMO 2003-2005 Business Plan* dated October 2002, Section 4.

– End of Section –

4. Approach, Schedule & Costs

4.1 Work Breakdown Structure

The following identifies the high-level project schedule for Phase 1 and the implied milestones.

Phase 1 is to be completed by April 2003 with the exception of the work on LMP which is to be complete by June 2003.

Phase 2 is to be completed by September 2003.

Subsequent timelines are yet to be determined.

Program Deliverables and activities

Stage/Activity	Deliverables	Activities
Phase 1 – Feasibility	<ul style="list-style-type: none"> • Program PDD for phase 2 of the MEP • Project PDDs • High level plans • High level estimates • Go/no go/modify decision 	<ul style="list-style-type: none"> • Further stakeholding under the Market Advisory Council framework • Establish likely implementation approaches • Identify market operating cost implications • Identify Standard Market Design and other US convergence implications and opportunities • Make recommendation to IMO Board on go/no go or modification of project based on above • Produce Project Definition Document which includes: <ul style="list-style-type: none"> • Cost estimates for phase 2 and high level cost estimates for the remaining phases (including accelerated write-downs and market participant costs if applicable) • Resource estimates for phase 2 and high level estimates for remaining phases • Project plans for phase 2 and high level estimates for remaining phases including initial schedules for market implementation • Knowledge transfer sufficient for projects to proceed without delay or impediment to quality • Make recommendations on the management structure of the MEP going forward

Stage/Activity	Deliverables	Activities
Phase 2 – Design	<ul style="list-style-type: none"> • Program PDD for remaining phases • Rolling wave plans • Rolling wave estimates • Updated cost/benefit • Go/no go/modify decision • Signed-off requirements • Draft Market Rules • Draft Vendor contracts 	<ul style="list-style-type: none"> • Data gathering and analysis internally and with stakeholders • Requirements definition signed-off by IMO users and stakeholders (mechanism to be defined) including acceptance criteria • Development of drafts of all necessary Market Rule amendments • Conduct any vendor contract discussions to point of draft contract • Development of plans (schedule and resourcing) for next phase and high level plans for remainder of project including consideration of the interaction with other MEP projects, capital projects and VCRs. • Update of all project documentation – PDD, capital and operating costs, benefits and risks • Recommendation on go/no go/modification in accordance with the OAR or previous IMO Board direction • Obtain decisions from Steering Group and IMO Board
Subsequent phases to be defined during phase 2		

Further information on deliverables and activities for phase 1 will be included in the MEP project plan for phase 1. Further details on deliverables and activities for phase 2 will be confirmed during phase 1.

For phase 1 the following activities are out of scope:

- Any requirements definition;
- Any detailed implementation plans;
- Any initiatives not identified in section 2.4.2; and
- Explicit analysis of the interaction with any other capital projects or Vendor Change Requests.

4.2 Project Schedule and Cost Summary

The breakdown of the project costs is as follows:

Type of Cost	Amount
Phase 1	\$1m
Phase 2	\$6.3m
Subsequent phases	Not estimated, product of Phase 2 elements

– End of Section –

5. Project Organization

The following outlines the organizational structure for Phase 1 of the *Program* (further information is given in the *Project Management Manual*).

As projects are approved for entering Phase 2, the PDD for each project will define a parallel structure, with each steering committee containing at least one IMO VP. Reporting of the individual projects will also be coordinated within the IMO consolidated capital project reporting processes (see *Capital Reporting Requirements* documentation).

5.1 The Program Steering Committee

The Program Steering Committee comprises:

Member: Bruce Campbell

Member: Bill Limbrick

Member: Derek Cowbourne

Member: Paul Murphy

Member: Gary Sherkey

The program steering committee is responsible for:

- Receiving regular reports and ensuring the program remains oriented towards its objectives
- Providing overall direction to the program as required
- Making available adequate internal resources
- Approving any additional funding required for the program
- Resolving any issues that are outside the scope of the program manager

5.2 The Program Sponsor

The Program Sponsor is: Dave Goulding

The responsibilities of the program sponsor are:

- Provide executive support to the program
- Approve the Project Definition Document

5.3 The Program Manager

The Program Manager is: Steve Mullins (IBM Business Consulting)

The responsibilities of the program manager are to:

- Plan, monitor and report on the progress of the program
- Identifying the program resource requirements for Phase 1
- Proactively identify potential deviations to the schedule or projected costs and institute remedial measures, including obtaining appropriate input and direction from the Program Sponsor and/or Steering Committee
- Provide subject matter expertise as appropriate
- Work with IMO and contract staff to create the program deliverables in accordance with this PDD

5.4 The Program Teams

The proposed key resources on the project are:

Program Management:	Steve Mullins and Greg Laycock
Day Ahead Market:	Len Kula
Better Optimisation Over Time:	Len Kula
Locational Marginal Pricing:	Mike Falvo
Short Term Resource Adequacy Initiatives:	Jason Chee-Aloy
Long Term Resource Adequacy Initiatives:	Jason Chee-Aloy
Environmental Information Tracking:	Hok Ng
Wholesale/Retail Settlement Changes:	Edward Arlitt
Stakeholder Process Management:	Drew Phillips

– End of Section –

Appendix A - Project (program elements) backgrounds

Resource adequacy

In addition to new generation, it is also clear that mechanisms need to be developed to facilitate a much greater portion of electricity demand becoming price-responsive. Enabling consumers to respond to price signals will have the dual benefit of reducing overall need for generating capacity, and ameliorating the high prices that occur in times of shortage. The IMO intends to use the Market Advisory Council consultation process to involve market participants and stakeholders in the deliberations on both the generation and demand side issues and to identify possible short-term actions that would facilitate early capacity additions. This objective will also be reflected in the IMO's broader regional market discussions with the New York, New England and Midwest ISOs.

Day-Ahead and Real-time Markets

A day-ahead market would allow participants to transact quantities and make critical operating decisions in advance of real time, thereby providing greater stability for the day at hand. The real-time market would act as a balancing market.

A day-ahead market is a key element of FERC's Standard Market Design, and is already included in the New York, New England, and PJM designs. The development of an Ontario day-ahead market would enable Ontario participants to more easily transact across borders, to participate more fully in a larger regional market, and would facilitate the short-term assurance of resource adequacy.

The IMO's "Straw Plan for Evolution of the Ontario Market Design", concluded that some form of day-ahead market is necessary to achieve price and operational stability and transparency. As well, it would allow the real-time market to become effectively a balancing market and hence the natural volatility of the real-time market would become less of an issue. Such a market would also assist the IMO in carrying out its functions to provide reliable physical market operations, and should help mitigate other current issues such as the Intertie Offer Guarantee. The lower volatility of a day-ahead market would also provide an improved point of convergence for the forward and futures market.

Wholesale/Retail Market Settlement Changes

The obligations that are placed on Local Distribution Companies (LDC's) affect wholesale market evolution decisions in several areas. These include, the tools the IMO needs to provide LDC's; prudential levels that must be posted by market participants; and settlement timelines.

Consideration of the various elements of the market evolution program will necessarily involve a re-examination of the obligations that are placed on LDC's in the Ontario market. Preliminary discussions have been held with the OEB - recognizing that this re-examination will necessarily involve the IMO and the OEB working with market participants and stakeholders.

Within the context of that broader examination, there is a need to review prudential requirements. For example, the pay/collect cycles, not only at the wholesale level, but also at the retail level, affect the appropriate prudential levels that need to be set by the IMO. Changes in the wholesale market, such as the addition of a day-ahead market and the introduction of a forward/futures market, could require parallel changes to the Retail Settlement Code. At the same time, opportunities could be developed to lower total prudential support that must be posted by participants through harmonized prudential requirements for participants that are active in real-time, day-ahead, and longer-term forward markets. In addition, settlement timelines would be reviewed in light of new market features to be introduced into Ontario.

Locational Marginal Pricing (LMP)

The Market Design Committee (MDC) contemplated a role for locational marginal pricing in a mature Ontario market. Consequently, the market tools were developed with the capability to calculate nodal prices, which could be used should the market evolve to settlement on a nodal or zonal basis. Nodal prices have been calculated and published since market opening for purely informational purposes. The resulting data allows the marketplace and the IMO to assess how actual market operation is reflected in nodal prices.

There are several perceived benefits of a locational marginal pricing model. FERC's Standard Market Design promotes the concept of locational marginal pricing for several reasons: it is an effective means to manage congestion and ensure that the transmission system is utilized in the most efficient manner, it avoids socialization of congestion costs, and the cost of transmitting energy between locations is better reflected in prices.

An essential prerequisite to assessing the benefit of any migration from the current uniform pricing model is a thorough analysis of the nodal pricing data gathered thus far. Also, the IMO must consider the impact of our pricing model on our ability to more seamlessly facilitate trade with other jurisdictions, particularly those with operating markets.

Better Optimization Over Time – Multi-interval optimization

Better optimization of bid and offer schedules over the day and hour would provide market participants with more assured and predictable dispatch and operating instructions. Further, it would assist the real-time assurance of supplies. Currently, the Ontario market is dispatched on a five-minute basis where energy and operating reserve are co-optimized within the five-minute interval only. Optimization of bid/offered resources over the hour(s) (or over the day in the case of a day-ahead market) would replace the dispatch currently used.

Operating experience with Ontario's market to date suggests that the lack of temporal optimization in the market dispatch process may be the cause of difficulties in the scheduling and dispatch of energy-limited and fast-ramping resources within the hour, and in the advance commitment of slow starting resources. These difficulties have caused an increased need for the IMO to take actions to constrain on, and to constrain off, plants to address the reliability of the IMO-controlled grid. The overall economic efficiency of Ontario's wholesale electricity market would be improved by the incorporation of temporal optimization.

The market designs in PJM and New York, often cited as the "successful markets" in the U.S., have processes and software that not only optimize the dispatch of resource offers/bids over time, but that also optimize the commitment of resources as well. To achieve the latter, the markets allow the

submission of multi-part offers/bids to allow the market operator to dispatch resources with the lowest total costs.

The project will address refinements to the dispatch algorithm and market rules to effect an improved optimization methodology. As with other changes in the market, evolution to achieve better optimization over time will be reviewed amongst market participants and other stakeholders.

Environmental Information Tracking

The Ministry of Energy has proposed the development and implementation of an Internet based Environmental Labeling and Information System (the “tracking system”) to provide consumers with credible information regarding the generation sources and related emissions of retail electricity products generated and consumed in Ontario. The information provided by the tracking system will assist consumers in making more informed choices, and lead to the increased contribution of “green” resources to meet Ontario’s electricity needs.

The *Ontario Energy Board Act, 1998*, provides the legislative authority to mandate the tracking system, including prescribing the requirements placed on program participants and the provisions of labels and certificates which characterize the relevant generation attributes associated with energy produced and consumed in Ontario, including imports and exports.

The proposed program has been undergoing extensive consultation with the IMO, the Ontario Energy Board and industry stakeholders. The IMO anticipates that the pending regulation will obligate the IMO to develop and implement the tracking system and a market for trading environmental certificates. The particulars of the program, including the specific role and responsibilities of the IMO and affected participants, will be set out in the pending regulation.

When the regulation is passed, it will be necessary for the IMO to develop and stakeholder the program rules, determine the functionality and characteristics of the required system, and develop the program implementation and administration procedures. This is expected to require significant work early in 2003.

– End of Document –