Options Paper on Energy Imbalance Market Footprint, Market Operator, Governance, Start-up Financing and Exiting

Contents

Introduction

The purpose of this paper is to identify, at a high level, issues, objectives and potential solutions for five inter-related elements necessary to implement an Energy Imbalance Market: ("EIM"):

- Geographic participant footprint options for the EIM;
- EIM Market Operator and related compliance obligations (NERC, WECC, NWPP, etc.);
- Governance of the EIM;
- Start-up financing of the EIM, including long-term costs (billing and market systems) to operate an EIM ; and
- Provisions for parties to exit the EIM.

The proposed EIM is a sub-hourly, real-time energy market providing centralized, automated, generation dispatch over a wide area. The automation of the EIM would allow for a more efficient dispatch of the system by providing access to balancing services from generation resources located throughout the EIM footprint and optimizing the overall dispatch, while incorporating real-time generation capabilities, transmission constraints, and pricing. However, unlike an RTO, it would not replace the current bilateral energy market, but would instead supplement the bilateral market with real-time balancing.

While the EIM market design has many similarities to those administered by ISOs and RTOs, this proposal does not include implementing an RTO in the Western Interconnection. The EIM could utilize tools and algorithms that have been successfully implemented in other centralized markets, but an EIM would not include a consolidated regional tariff for basic transmission service (e.g. network or point-to-point). But the EIM would use a coordination tariff to address provision of generation and load energy imbalance, replacing some Ancillary Service Schedules of participating transmission provider tariffs.

Participation in the EIM market would be voluntary on a balancing authority or transmission service provider basis, and its operation would incorporate real-time generation capabilities, transmission constraints, and pricing. Once a balancing area / transmission provider system opts-in, then the load-serving entities and generator operators in that footprint are automatically included in the EIM footprint. However, their subsequent participation in EIM energy transaction through bidding/offering remains voluntary. Generators would offer their output into the market or self-schedule their output and imbalances would be settled at the

Energy Imbalance Market clearing price. Loads would self-schedule their deliveries (matched to generation) and would be settled at the market clearing price for energy for imbalances. For any hour, imbalances in the Energy Imbalance Market could be settled for every 5-minute period, so entities within a participating Balancing Authority Area would see some settlement difference from the typical hourly settlement currently used by most BAAs. Alternately, the EIM could use 5-minute dispatch setpoints and price calculations but settle at the hourly integrated energy volume multiplied by the hourly averaged nodal price.

At its April 2010 Meeting, the WECC Board of Directors (Board) approved a proposal for a Cost-Benefit Analysis of the Efficient Dispatch Toolkit (EDT), subject to final approval of the 2011 Business Plan and Budget. While there are many factors that must be considered in future decisions beyond the monetary costs and benefits, this study will help provide the Board and the WECC Membership with credible data to support informed decision making.

The costs and benefits will be analyzed separately, and then netted to determine an overall net benefit (or net cost). The cost analysis will be based on cost estimates of several major components and will be identified for both the Market Operator and the market participants. The benefits side of the analysis will be based on production cost modeling of several scenarios. The net benefit will be identified as the difference between the total benefit and total cost, and will be identified as a range. Results will be presented on a WECC-wide basis, as well as at the Balancing Authority (BA) and subregional levels.

The cost-benefit analysis is expected to be completed in June 2011, and will be presented to the Board of Directors at their June meeting. For more information on the Cost-Benefit Analysis, see the Efficient Dispatch Toolkit page on WECC's website at: http://www.wecc.biz/committees/EDT/Pages/default.aspx. This page includes links to the Scope of the Cost-Benefit Analysis, Frequently Asked Questions, and meeting dates and materials.

1. Footprint Options

Issue: What should be the footprint of an EIM? What is the minimum critical mass to create a cost-effective EIM? Do EIM participants need to be contiguous? If not, how will the transmission rights among EIM participants be handled if bids are accepted across non-participant Balancing Areas ("BAs")?

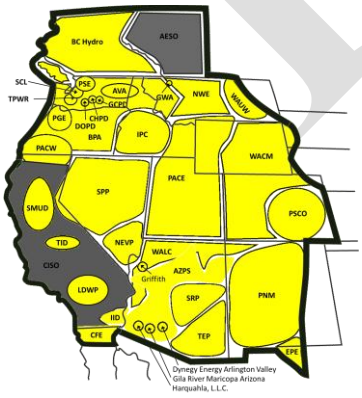
Objective: To identify alternative geographic configurations of an EIM and identify potential configurations that result in a critical mass sufficient to justify the cost of an EIM, and economies of scale in alternative footprints. Cost considerations must include distribution of start-up and operating costs (systems and staffing) and the ability to create enough competitiveness in bidding to avoid uneconomic bid/ask spreads in the EIM. This paper discusses the pros and cons of eight possible EIM footprints. The WECC cost/benefit study currently underway will provide quantitative information that will be useful in determining critical mass and economies of scale.

Common to all Options: There are several issues common to all footprint options:

- Participation means actively bidding and settling through the EIM.
- In all footprint options there will be seams between EIM participants and non-participants. Seams issues are addressed in a separate paper developed by the WECC Seams Issues Subcommittee (ADD LINK).
- There is not a requirement that BAs participating in the EIM be contiguous, as has been demonstrated in other market regions (for example the participation of Commonwealth Edison (Chicago) in the PJM market design). However, non-continuous operations increase seams coordination burden.

Options: Eight EIM footprint options are described below. These eight represent general footprint possibilities. Other configurations may be feasible.

1.1 All of the Western Interconnection except CAISO and AESO



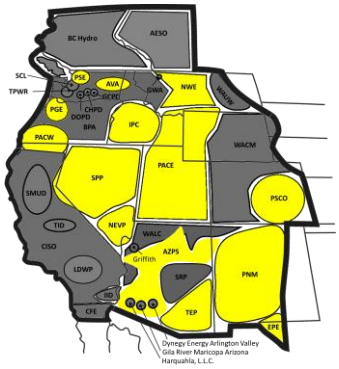
This option assumes that all BAs, except the California ISO ("CAISO") and Alberta Electric System Operator ("AESO"), participate in the EIM. It is assumed that the CAISO and AESO would not bid into or settle through the EIM. However, generators in those footprints might participate. Additionally, the California ISO or ASEO could be an agent of the EIM, operating a state estimator, or be the market operator. Interaction at the seams between the EIM and the CAISO and AESO markets are addressed in a separate paper (ADD LINK TO SEAMS PAPER BY SIS).

Pros: This large footprint (577,533,649 MWh) would maximize the benefits of an EIM by ensuring many players are participating

and keeping bid prices reasonable, minimizing the market operation costs per MWh. Start-up investment would be spread across a broader base of participants.

Cons: As the number of potential participants in an EIM increases, the difficulty of reaching agreement on implementation and operations decisions increases, which could increase delays to implementation.

1.2 Western Interconnection – Opt-In Critical Mass (assumed in map to be Investor-Owned Utility ("IOU") BAs only, which have a total load of 304,204,246 MWh)



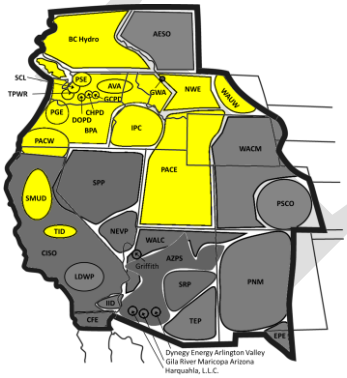
This option would involve only those BAs that opt into the EIM. Opt-in BAs would not need to be contiguous.

Pros: This may be the most likely path to implementing an EIM. Market-to-Non-Market seams coordination methods would be used to coordinate operations with the non-participants. Those opting in later may pay a higher entry fee to compensate for the risks taken by the early adopters. This option would not require a redefinition of existing institutions, such as ColumbiaGrid, NTTG and WestConnect, because participation would not necessarily be defined by membership in one of these institutions.

Cons: It is not known what "critical mass" would justify investing in EIM start-up costs.

1.3 Sub-regional footprint(s) options

1.3.1 Northwest Power Pool/ColumbiaGrid/NTTG footprint

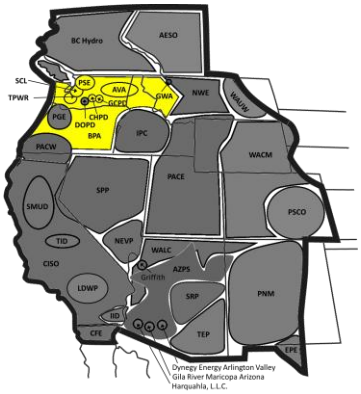


This option would include members of the Northwest Power Pool, Columbia Grid, the Northern Tier Transmission Group (NTTG), and BC Hydro.

Pros: The large footprint has the advantage of geographic diversity in the location of renewable generation and loads. There are existing agreements among many or all of the BAs.

Cons: There may be difficulty in reaching agreement among the diverse parties within this footprint, which includes seven IOUs, numerous municipal utilities/public utility districts, and one federal power marketing administration.

1.3.2 ColumbiaGrid footprint

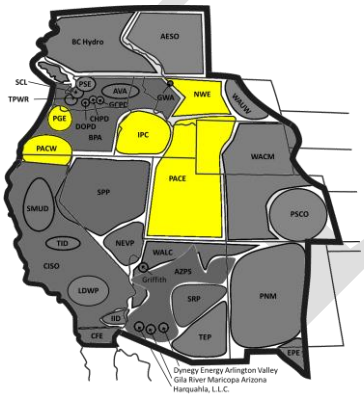


This option would be limited to Avista Corporation, Bonneville Power Administration, Chelan County PUD, Grant County PUD, Puget Sound Energy, Seattle City Light, Snohomish County PUD, and Tacoma Power.

Pros: May be easy to reach agreement among a smaller group of BAs with a history of working together.

Cons: This is a relatively small footprint (118,472,699 MWh). Start-up and operating costs will likely be relatively high on a per/MWh transaction basis. There may be limited dispatchable generation (particularly in low hydro years) to offer into an EIM, creating risk of very high market prices in a bid market. There may be little benefit from aggregation of imbalances due to variable generation because BAs would generally be experiencing the same weather conditions simultaneously because most of the wind is in the same location (Columbia Gorge). The impact of one participant exiting may be more significant in a small footprint compared to a large footprint with more participants. Limited number of participants increases risk of creating wide market spread for imbalance pricing.

1.3.3 Northern Tier Transmission Group footprint

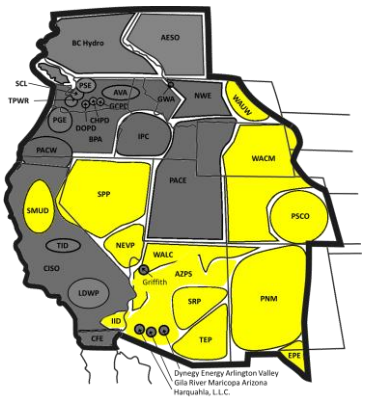


This footprint is limited to PacifiCorp, Idaho Power, Portland General Electric, Northwestern Energy and Deseret G&T.

Pros: These companies work together on transmission planning. Several of the BAs have shared long-term arrangements on use of transmission lines. There would be greater diversity in the location of wind generation and in loads than in the ColumbiaGrid option.

Cons: This option has a relatively small footprint (119,227,147 MWh) and limited number of parties to offer into an EIM. Start-up and operation cost would be relatively high per MWh of transactions. The impact of one participant exiting may be more significant in a small footprint compared to a large footprint with more participants. Limited number of participants increases risk of creating wide market spread for imbalance pricing.

1.3.4 WestConnect footprint

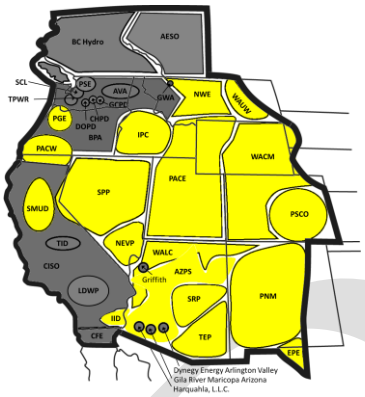


This footprint is limited to APS, El Paso, IID, NV Energy, PSCo, PNM, SMUD, SRP, Southwest Transmission Cooperative, Transmission Agency of Northern California, Tri-State G&T, Tucson Electric, and WAPA.

Pros: WestConnect has a broad geographic footprint with diverse generation and loads (231,371,147 MWh).

Cons: There may be difficulty in reaching agreement among the diverse membership of WestConnect which includes IOUs, public power utilities and a federal power marketing administration.

1.3.5 NTTG + WestConnect

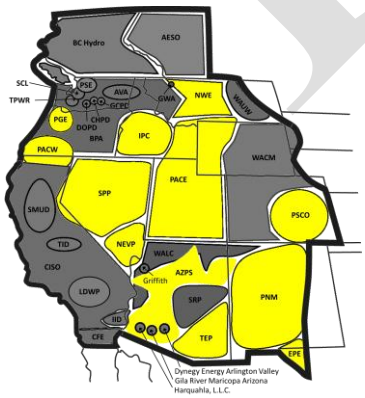


This footprint would include all of the Western Interconnection, except the California ISO, AESO, ColumbiaGrid and British Columbia.

***Pros*:** The large footprint includes diverse generating resources and loads (350,598,778 MWh). It includes most of the high quality wind, solar and geothermal resources in the interconnection.

***Cons*:** Like the WestConnect option, it may be difficult reaching agreement among the diverse membership, which includes IOUs, public power utilities and a federal power marketing administration, although there is only one federal power marketing administration in the footprint.

1.3.6 IOUs in NTTG + WestConnect



This footprint would be NV Energy, APS, Tucson Electric, El Paso, PNM, PacifiCorp,PSCo, Northwestern Energy, and Portland General Electric (268,017,875 MWh).

Pros: The footprint would include diverse generating resources and loads. Participants are all FERC jurisdictional.

***Cons*:** There would be many more seams between EIM participants and non-EIM participants.

2. Market Operator Options

Issue: What institution should operate an EIM? Is previous experience in operating a market a critical criterion by which to evaluate the options?

A Market Operator would:

- Operate a sub-hourly, real-time energy market providing centralized, automated generation dispatch and prices for each 5-minute interval;
- Dispatch the generation to balance supply and demand and manage congestion, to the extent it is offered, available, and deliverable[1];
- Perform a balancing market settlement function (billing, collections, credit issues to participants, etc.) upon completion of each balancing market operating hour[2]; and
- Have a Market Monitor, either in-house or via a contractor, to monitor any potential gaming of the system and implement rules regarding the disgorgement of profits from violations of market rules.

The Market Operator will rely on data flows that are presently collected by the WECC Reliability Centers. The Market Operator will be responsible for compliance under some reliability standards pursuant to a standards compliance delegation agreement to be established[3]. The Market Operator will need to file a tariff with FERC which will govern market operations.

***Objective*:** A Market Operator needs to cost-effectively execute the tasks outlined above and meet any legal requirements established by FERC.

[1] The Market Operator would use a reliability-constrained, pooled economic dispatch from voluntary offers. To do this, the EIM uses a real-time, state-estimated image of the actual electric grid. The state-estimated image is used in regional energy market applications because it is able to detect and discard individual data points which may be inaccurate, for example, due to telecom failures or meter error. The state-estimated model then applies a contingency analysis to detect which portions of the grid may be subject to unacceptable operating conditions post-contingency. Using the information developed through this process, the EIM then calculates a least-cost energy resource dispatch, taking into account the following factors:

- Dispatch cost of offered resources;
- Marginal loss effect on energy supply from resource alternatives; and
- Reliability limits to dispatch flows, for both existing and post-contingent grid conditions.

The real-time physical dispatch of the system will be based on an optimization of the offered resources. Like other organized markets, the EIM would use central automated dispatch. However, contingency reserves and regulating reserve requirements will remain the responsibility of the balancing authority. Participating entities can continue to schedule bilaterally, including hourly schedules, up to real-time.

[2] Each participating transmission provider or designated meter agent for participating load-serving entities supplies billing meter data to the EIM operator, which is used to perform energy imbalance settlements. Energy Imbalance Service is calculated for each nodal generator and for the aggregation of load-service delivery nodes for each load-serving entity.

[3] For example, other regional market organizations have established agreements with participating balancing areas that define roles and responsibilities for standards compliance. The most similar design in operation to the proposed EIM function is the SPP regional market. Their standards compliance delegation agreement is filed with FERC in Docket ER06-451-000.

***Options*:** The Market Operator could be: 1) a new division within WECC; 2) a reconstituted form of one or more of the existing Subregional Entities (e.g., WestConnect, NTTG, ColumbiaGrid, Northwest Power Pool); 3) an existing third-party which operates a market; or 4) a new third-party market operator. The third-party operator could be an expansion of an existing market operator (e.g., the California ISO, SPP, MISO, ERCOT, or PJM), an operating division of a major software vendor (e.g. OATI, Areva) interested in expanding their business, or a new for-profit or not-for-profit entity.

2.1 New Division within WECC. This option has the advantage of a technically seamless flow of information – from the WECC Reliability Centers to the Market Operator function – necessary to operate the EIM. It could also take advantage of existing organizational infrastructure, such as the legal and human resources functions.[4] WECC is already FERC jurisdictional under Section 215 of the Federal Power Act. The structure of this option could parallel that of the Southwest Power Pool which is both a Regional Reliability Organization and a market operator.

The disadvantages of this option are:

- The WECC organization has no institutional experience operating a market or administering a tariff.
- The WECC Board includes market participants and would need to be reconstituted, at least for the purpose of governing the market operation activities.
- The current WECC decision-making structure does not respond rapidly to new conditions (although this could change with a new governance arrangement for an EIM).
- If the EIM footprint is only part of the Western Interconnection, WECC may have difficulty separating its interconnection-wide responsibilities from responsibilities to the EIM participants.
- There would need to be changes to accommodate a market operator function. For example, Bylaws changes may need Member approval, which could be difficult if the market footprint does not include all of the WECC footprint.
- FERC jurisdiction under Section 215 of the Federal Power Act is different and would require separation from any Section 205 jurisdiction. Furthermore, FERC needs to approve any new functionality of WECC, as the Regional Entity.
- Governance issues would need to be addressed.

2.2 Reconstitution of One or More Subregional Entity. The advantage of this option is that there is already familiarity and communication among companies within each Subregional Entity on a variety of subjects (e.g., transmission expansion planning, OASIS and Joint Initiatives) and there is some name branding associated with the Subregional Entities.

The disadvantages are:

- The primary focus of Subregional Entities has been on transmission planning, ATC issues, ACE Diversity Initiative, intra-hour scheduling, DSS, and ITAP.
- Subregional Entities have no experience operating markets.
- The governance of the Subregional Entities would need to significantly change.

[4] Other options involving existing institutions could also take advantage of existing organization infrastructure.

- The Subregional Entities are funded by contributions from their members. They do not have experience in raising funds from financial markets.
- If multiple Subregional Entities each implement their own EIMs, they would create Market-to-Market seams coordination issues which would need to be addressed. In addition to this increased contract and operational complexity, there would likely be duplicative start-up and operating costs incurred.

2.3 New Third-party Market Operator.

A new institution could be created with the sole purpose of running the EIM market. The advantage to this path would be that the institution would be narrowly focused on the market operator function and could be tailored to meet the specific needs of its member organizations. The disadvantages of this option are:

- It's unclear if there is any entity that wants to create an institution from the ground up.
- The start-up costs might be greater in creating a new institution rather than changing an existing institution.

An existing institution, such as a major vendor to the electric industry (e.g., OATI, Areva) could decide to expand their business to include market operation. These types of institutions have knowledge of information flows and software necessary for an EIM to function, but no organizational experience with actual grid operations. However, these parties do not have experience operating markets with transmission system dispatch or generation operations. They may lack experience with optimizing dispatch within security constraints.

It is unclear if any existing vendor institution wants to expand into the market operation business. This has not occurred in other markets.

A third-party market operator may not provide a long-term stable operation. For example, if the EIM operator is a for-profit organization and it finds that operating an EIM is not sufficiently profitable it would terminate the Market Operator function. Additionally, stakeholder and board oversight of the organization would need to protect against excessive cost; the third-party operator could become increasingly expensive. However, if the third-party market operator is FERC jurisdictional, there would be some regulatory oversight of costs.

2.4 Existing Third-Party Market Operator. Existing ISOs/RTOs (California ISO, Alberta Electric System Operator, SPP, MISO, ERCOT, PJM) have established market operations and could potentially operate a Western EIM as a new division of their organization. They have experience in operating a market and performing market settlements and market monitoring. Some of their software may be adapted to a Western EIM design. Existing institutional infrastructure (e.g., human resource department, legal department) could be leveraged and potentially provide for lower start-up costs compared to other options.

The disadvantages of using existing market operators are:

- It is unclear if any existing market operator is interested in expanding their activities to include operation of a Western EIM.
- Operating a Western EIM may be a low priority for the organization compared with its existing functions.

- With the exception of the California ISO and Alberta ESO, these operators have no experience operating in the Western Interconnection.
- Significant modifications of market operations and settlements staffing, software and new hardware will be needed to enable an existing market operator to run a Western EIM. Note however, these may be common challenges posed by the other alternatives as well.

3. Governance

Issue: How will the EIM Market Operator be governed? Does the governance of the Market Operator need to be approved by FERC? What role should market participants or state/provincial regulators play in the governance of an EIM Market Operator?

Objective: The objectives of an EIM governing body are to: oversee the Market Operator staff or contractor; oversee the Market Monitor function; implement efficient operations; and approve, file with FERC, and implement market rules.

The administrator of the EIM would manage a market (or regional markets) for real-time energy balancing across existing utility boundaries and coordinate redispatch to manage transmission congestion. While the precise contours have not been established, it appears that, unlike an RTO, the administrator would not (a) assume functional control of transmission systems, (b) administer the open access or other transmission tariffs of involved transmission systems or otherwise be a transmission provider, and (c) would not assume a transmission planning function. Coordination of redispatch, however, would of necessity involve some form of agreement by generators and transmission providers to abide by the administrator's coordination instructions.

Following are some of the considerations in a corporate structure (not in priority order):

- Status as a FERC jurisdictional entity or not
- Corporate structure
- Board makeup and stakeholder input
- Tariff development
- Market monitoring
- Operational reliability

All of the other organized electricity markets in the United States (with the exception of ERCOT) are directly regulated by FERC, and all provisions of their tariffs, including provisions relating to governance are subject to FERC approval. To the extent that the EIM would be operated within the Western Interconnection (WI), the provisions of its tariff, including those rules or by-laws pertaining to governance, can be expected to be subject to FERC approval.[5]

[5] Section 201(e) of the Federal Power Act provides that the Commission shall regulate as a "public utility" only an entity which either effects sales of power at wholesale or transmits power in interstate commerce. If the energy balancing market administrator operates a LMP oriented platform that determines the price of energy by selecting units for dispatch, it may well be on the jurisdictional side of the line. Similarly, the Commission will assert "jurisdiction over those persons that are in a position to exert effective control over facilities used for the . . . resale

Options: This paper examines the following types of structures:

- Not-for-profit entity (corporation)[6]
  - Market participants as members
- For-profit entity (corporation or limited liability company)
  - With private equity investors as shareholders, which may include (but need not include) market participants

3.1 FERC Jurisdiction: Most of the existing organized markets are structured as independent not-for-profit corporations, subject to oversight by FERC. The New York ISO and ERCOT, however, are to some degree subject to the oversight of the state public utilities commissions in their respective states. However, the proposed EIM, as a multi-state entity, would not be subject to direct state commission oversight.

3.2 Corporate Structure Options:

3.2.1 Not-for-Profit Corporation: The majority of RTOs are not-for-profit corporations. Market participants would be members of the corporation. State statutes determine the basic characteristics of the entity, as indicated:

- Statutes significantly determine governance structure: Governance by a board of trustees (directors) and officers; the extent of member influence or control is determined by the bylaws
  - Member rights under bylaws could allow for stakeholder involvement
- Payment of dividends or other distribution of "profit" is prohibited, by statute.
  - Start-up or other major funding requirements could be arranged through loans from external sources, or loans or contributions of members
    - Loans from external parties can have the same security (collateral) arrangements as in a commercial context
    - Member funding, e.g., by loans, or contributions in exchange for any sort of entitlements, must fit the no-distribution of profits requirement (would need to be worked out with the State of organization)

The advantages of a not-for-profit corporation are:

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of electric energy in interstate commerce."[5] The administrator's coordination of dispatch to manage congestion may well result in FERC jurisdiction.

[6] A limited liability company (LLC) is inherently for-profit (state statutes do not provide for not-for-profit LLCs as they do for corporations). A LLC can be operated on a not-for-profit basis as a practical matter (e.g., PJM Interconnection, LLC). We do not address this possibility further at this time, except to note below that an LLC operated for profit can be more tax advantageous than a for-profit corporation.

- Cost-based operations without a return on capital investment may be more economical to customers than a for-profit operation
- Market participants would be the members of the organization
  - These members would have ultimate control over governance, including election of the board of trustees (directors)
  - Through bylaws and elections, members likely to have ultimate authority over extent of stakeholder involvement
- Income tax on margin (profit) likely avoidable at State and Federal levels

One disadvantage of a not-for-profit corporation is that depending upon oversight and culture, cost base operations without profit incentives can foster unnecessary staff growth, inefficiency, and undue complexity. Some believe this is a central RTO failing. In addition, ready participation by market participants can add to costs, complexity, and gridlock. Finally, ability to fund by borrowings is probably affected more by economics and security than by the legal nature of the entity, but the lack of "equity" tends to diminish financial strength and can make loans more costly.

3.2.2 For-Profit Corporation: Another option is a for-profit corporation. The basic characteristics of a for-profit corporation are as follows:

- Governance is significantly set by statute: a for-profit corporation is owned by shareholders. Shareholders elect a board of directors and the board elects officers. Profits are paid through dividends.
- No "membership" (stakeholder) structure. The corporation will consider views of members in its discretion, though commitments to stakeholders and formal processes may be established through tariff filings (if under the jurisdiction of a regulatory agency) or potentially bylaws.
- Funding through capital contributions (equity) and debt.
  - Equity investors contribute to capital; issuance of stock documents ownership positions.
  - Dividends may be issued to stockholders, thereby providing return on equity investment. Stockholders can also be lenders, as can external parties.
  - Capital enhances the corporation's financial picture, possibly resulting in relatively lower interest rates and debt service
  - For-profit structure facilitates equity investment by external sources (e.g., private equity investment funds, or a combination of funds and other owners; market participants can be but need not be excluded). Potential return on investment induces external sources to invest, reducing or eliminating the need for market participants to fund startup. Return on investment could arise from rates which would include a return on investment (ROI) (e.g., transmission rates). See discussion of FERC jurisdiction below.
    - Investors would need assurance of the business plan, which involves contractual protection against default due to exit of

participating balancing areas / transmission providers (beyond the scope of this memorandum).

The advantages of a for-profit corporation are:

- Profit-based operations arguably produce higher efficiency and better service than not-for-profit operations
- Ability to raise start-up capital
    - Equity easier to raise due to ability of the business to yield a return on investment
    - Debt funding may be easier to obtain due to equity investment strengthening of entity financials
    - Lack of need for market participant funding may increase acceptance of overall concept
- Because the legal structure does not provide for a customer "right" of involvement in market rules, market participant involvement can be set at an appropriate level, balancing the needs of market participants against efficiency

The potential disadvantages of a for-profit corporation are:

- If entity is unregulated (which may not be the case because of FERC jurisdiction), profit is not regulated; unduly high cost of market administration could undermine participation in the markets
- Insufficient stakeholder involvement could result in unacceptable market rules. If subject to regulation, however, this result is less likely.

3.3 Board of Directors Options: There are several possible mechanisms for appointing members of the proposed EIM's Board of Directors: (1) as in the New England ISO, once an initial Board is constituted, the EIM could be governed by a Board of Directors that elects its own new members by a majority vote upon the expiration of the term of a seated director; or (2) as in the California ISO, Board members could be appointed by the Governor and subject to approval by the State Senate. In either case, Board Members must have no financial interest in any company doing business in the electricity markets subject to EIM's authority. There is an issue as to how the initial Board of Directors would be selected if the preference is for the creation of a self-selecting Board.

3.3.1 Hybrid Approach #1: Under a hybrid model, if, for example, transmission providers in states within the WI agree to participate in the proposed EIM, the Governor of each of those states could initially select a Board Member (with or without legislative ratification), and those state-selected members could choose, by majority vote or by weighted voting, a number of additional independent voting board members. The seats of the state-selected members would always be state-selected, whereas the seats of the independent members would always be subject to the discretion of the Board itself.

The main disadvantage of this approach is that the number of Board members could be unwieldy. A threshold question, therefore, is what the optimal size for the EIM's Board of

Directors would be. By way of examples, ISO-New England's Board has 10 members, whereas the CAISO's Board has 5 members.

3.3.2 Hybrid Approach #2: Another hybrid approach would be to have the Governors of each state in which there would be transmission providers participating in the EIM appoint a committee that would select the initial board members. The initial Board members selected by this committee (by a majority, weighted voting or super-majority vote – another detail that must be addressed) would thereafter select their successors themselves.

There are many details concerning the operation of the Board of Directors that would need to be worked out in advance, including, frequency of Board meetings, Board Committee structures, selection of Board Officers, compensation of Board Members, etc. However, determinations regarding these more detailed issues should await a determination on the more overarching issue of the basic structure of the Board and how Board members should be appointed.

Staff Structure and Functions: The Board would appoint a CEO of the EIM, who would be responsible for the day-to-day operation of the market, including the preparation of budgets, proposed tariff filings to FERC, etc. The CEO would be responsible for staffing the organization. The by-laws and rules and regulations addressing staff structure and functions would be subject to Board approval.

A key threshold question is whether the basic outlines of such rules and by-laws should be developed before the EIM itself (and its initial Board of Directors) is instituted or whether the development of such rules and by-laws can await the appointment of an initial Board, which would develop such rules and by-laws prior to the actual implementation of the EIM.

3.4 Tariff Development: The development of the specific provisions of the EIM's tariff (which would be subject to FERC approval) will require a substantial effort. The WECC Seams Issues Subcommittee is already working on the basic outline of how the EIM would operate, but once there is general agreement on this outline, much effort must go into the "grunt" work of turning these concepts into a draft tariff that can be submitted for FERC approval.

Key threshold questions are when and under whose oversight will this initial tariff development take place, *i.e.*, before or after the institutional establishment of the EIM, and under the direction of WECC and the State-Provincial Steering Committee or under the direction of the EIM's initial Board of Directors.

3.5 Market Monitoring Function: The EIM will require a market monitoring function. The Market Monitor will have to be under the direction of the Board, not of EIM management. Key threshold questions to be resolved are whether the Market Monitor should reside within the EIM or operate independently of it, and, if the latter, whether the market monitoring function should be contracted out to an existing third-party vendor or created as a new, separate entity as part of process of developing the EIM itself.

3.6 Operational Reliability: Finally, all of the existing independent markets are subject to NERC/FERC's mandatory reliability standards. Given its more limited functions, the

EIM will, perhaps, be subject to fewer of these standards, than, say, PJM or the SPP, but it will in any event be subject to certain of these standards. Thus, in the development of the EIM and its tariff, thought must be given to how the EIM will assure compliance with these standards and who will be responsible for the payment of penalties if any such standards are violated in the course of the functioning of the EIM.

4. Start-up Financing Options

Issue: How will the start-up of an EIM be financed? Guesstimates are that start-up costs may be approximately $50 million or more.[7]

The purpose of this section of the paper is to outline a set of start-up financing alternatives for implementing an EIM, which would include both up front capital investment needed to establish an EIM infrastructure and long-term costs required to operate and maintain billing market systems. This section addresses advantages and disadvantages of these options. Ultimately, this section is intended to address some of the fundamental issues and challenges associated with securing and maintaining sufficient financing for an EIM in which the balancing area / transmission provider participation is strictly optional, with reasonable but flexible limits on entry and exit. Any risk that there will not be adequate levels of participation to ensure repayment of financing commitments, including any premiums required by investors must be addressed. If not, investors will be reluctant to fund the required capital. Any viable financing option must address this risk.

Different financing models will have different corresponding risk profiles and also different incentives for project delivery and operation. The key component to any financing model, therefore, is assessment of the level of risk taken by the funding entity or entities as well as any other incentives or disincentives for efficiency. Higher risk requires a higher return to elicit the required investment. Accordingly, any financing model will need to take into account various return on equity values to match the risk profile for an entity with the voluntary nature of participation in the EIM and resulting variable income levels.

Objective: Financing of the start-up of an EIM should:

- Provide incentives for the efficient and timely start-up of an EIM;
- Not discourage participation in an EIM; and
- Not burden early participants in an EIM to the undue benefit of later entrants.

Options: There are at least four primary financing model options for funding EIM start-up costs:

4.1 Market Operator Line of Credit

Under this option, the designated Market Operator seeks a line of credit which funds start-up of the EIM. This was the model WECC used to fund the development of Reliability

[7] A financial analysis of start-up costs, on-going operating costs, including an allowance for the initial implementation schedule, should be performed. The WECC B/C analysis will include an estimate for these costs. The referenced number comes from the experience of the Southwest Power Pool implementation experience.

Centers. The entity is typically expected to pay back the line of credit within a certain number of years. In the Reliability Center example, the line of credit had to be approved by FERC as an allowable expenditure of funds under Section 215 of the Federal Power Act (the section which establishes reliability standards and funds NERC and WECC). Some form of regulatory approval would likely be required for EIM activities and such approval is not certain. In October 2010, FERC approved WECC's 2011 budget which included funds for a study of the benefits and cost of an EIM. FERC has indicated that funding authorization under Section 215 of the Federal Power Act would likely not be available to implement and EIM. Thus, the start-up loan would not be backed by Section 215 funding in the fashion of the WECC Reliability Center loan. Authorization under Section 205 of the Federal Power Act may be the more appropriate mechanism for the EIM scenario.

4.2 Increased Membership Dues

Under this option, an existing organization with membership increases dues to fund the start-up of the EIM (e.g., WECC). This was the model Southwest Power Pool ("SPP") used. SPP financed the development of its Energy Imbalance Service ("EIS") through an increase in member dues (Schedule 1-A, Administrative Fee). The Administrative Fee is established annually by dividing projected expenses based on the SPP budget for the calendar year by the projected annual Schedule 1-A billing units for the calendar year. For the EIS market launch, the expenses included hardware, software, and staffing related costs. The ongoing costs of administering the EIS market continue to be recovered through annual changes using the Administrative Fee.

This option may only be available if WECC or a Sub-Regional Planning Group with a dues structure was the Market Operator. Prior to Section 215 funding provisions, and in situations today which do not meet Section 215 criteria, WECC increases dues on members for specific projects. However, historically the costs of such projects were significantly less than the anticipated cost of establishing an EIM. For example, the Western Interchange Tool ("WIT") project was funded through member dues.

An important challenge or limitation associated with this option is the fact that membership dues are imposed upon all current members, whereas, not all WECC members may decide to participate in the EIM. Accordingly, an EIM is unlikely to benefit all participants in the interconnection (e.g., California ISO and ASEO), and thus, levying dues on all parties would not be equitable and would be met with extreme opposition by some parties. Another challenge would be timing related to collection of a sufficient amount of dues to fund start-up costs and potential resulting delays in EIM implementation.

4.3 Market Participants Funds for Bond-Financed Start-Up

Under this option, likely market participants form an entity which provides funds for start-up bonds to establish the EIM. This was the model used by the Midwest ISO. The funding entity would be obligated to make payment on the bonds by a certain time, however, repayment funds would only be available once the market is operating and generating revenue. This places a great deal of risk upon the initial funding entity. A workable variation is the "anchor tenant"

model whereby initial funders provide capital or guarantee the loans/bonds for start-up costs and initial infrastructure and in exchange for taking on this risk, receive favorable incentives not available to later entrants who do not take on a corresponding funding obligation. Examples of such benefits include:

- Initial funders get repaid their initial capital outlay at an attractive (15% or more) return repaid over an acceptable term by the market once operating-assuming operating costs include debt service costs
- Initial funders are repaid by late jointers for their early infrastructure, start up and operating costs investments with an attractive ROE
- For loan guarantees, initial funders receive a discount to the price paid by market participants during early market operations, i.e., first 3-5 years as compensation for their risk

4.4 Market Operator Venture Capital Funding

A third-party Market Operator provides the start-up capital with a risk premium. Since the Market Operator takes on all risk, the risk premium could be significant. Under this option, a third-party Market Operator (particularly a for-profit Market Operator) may be willing to fund EIM start-up costs either based on expected future profits or some minimum level of subscriptions. There may be inherent market power limitations or prohibitions on a Market Operator's ability to run the EIM and also be a market participant.

5. Exit Provisions

Issue: The voluntary nature of the EIM makes it essential to understand and structure the circumstances where one or more balancing area / transmission provider parties can terminate their participation over time. As stated above, the EIM will have substantial start-up costs and ongoing operating costs. As the market expands those costs are spread over a larger number of transactions and benefit all of the market participants. Conversely as the market contracts, costs rise for market participants.

What should be the obligations of balancing area / transmission provider parties exiting the EIM? How should obligations vary based on footprint size/number of participants, given disproportionate impact of a single participant exiting from a smaller market compared to a more robust market?

Objective: Allow parties to easily exit the EIM, provided the exiting parties shoulder their share of start-up and any other committed costs. In contrast, allowing easy exit from the EIM without a sunk cost payment may encourage greater initial participation due to simpler risk exposure calculations in the participation decision.

Structure the entrance/exit provisions to incent a longer term commitment

- Minimum term (1-2 years) once committing into the market (discourages an exit decision by a party based upon one month's bad experience or start-up problems.

- Minimum stay out once an exit decision is made (1 year)
- Increased entrance charge for a re-entry later for any entity that chose to exit
- Anchor tenant discount on services for early subscribers that fund or guarantee debt
- Require any party that exits early to fund a portion of committed costs as an exit fee (barrier to early entry)

Options: The ease of exiting may vary based on the choices of Market Operator and start-up financing. A third-party Market Operator will likely require a subscription for a fixed period of time and include risk of exit costs as part of its subscription contract.

If WECC or a Sub-Regional Planning Group(s) is the Market Operator there will be committed costs that would need to be paid by the exiting party. Under FERC policy for Regional Transmission Organizations (RTOs), participation is not mandatory and operating costs are allocated to all RTO tariff customers. If a new utility system joints an RTO, costs for all are reduced. Conversely if a participating utility system exits the costs for remaining participants increase. This conceptual approach could also be utilized for the EIM footprint. A voluntary market implies ease for utility systems to come and go. Minimum terms and exit penalties begin to eliminate the voluntary nature of the market and create a barrier to entry due to increased perception of risk. There is no legislative or public utility commission mandate stakeholders to establish the EIM. Therefore offering potential balancing area / transmission provider systems the option to join a voluntary structure with reasonable flexibility to come and go should be strongly considered. The risk that utility systems can come and go is likely to incent the market operator to remain efficient, to work with stakeholders to correct issues, etc.

The options outlined above are depicted in the summary matrix below.

Summary Matrix of Options

Element	Footprint options							
	1. Western Interconnection outside of CA ISO and AESO with opt out	2. Anchor tenants – opt-in group of utilities to reach a critical mass	3. NWPP+Columbia Grid+NTTG	4. ColumbiaGrid footprint	5. NTTG footprint	6. WestConnect footprint	7. NTTG+West Connect	8. IOUs in NTTG +WestConnect
2. Market Operator options								
2.1 New division of WECC								
2.2 Reconstitution of one or more Subregional Entity								
2.3 New third party Market Operator								
2.4 Existing third-party Market Operator								
3. Governance options (assuming governance must be independent from market participants)								
MORE REARCH NEEDED								
4. Start-up financing options								
MORE RESEARCH NEEDED								
5. Exit options								