

Products for eMIX

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The following is an proposed initial set of products for eMIX to substitute for the products in Bill Cox's EA diagrams for EMIX:

http://www.oasis-open.org/committees/download.php/39515/Emix_Class_Diagrams_20100922.zip

1. Transactive Products

The basic transactive product is energy delivered over an interval. The TeMIX White Paper (<http://www.oasis-open.org/committees/download.php/37954/TeMIX-20100523.pdf>) outlines an end-to-end model for electricity markets based only on

- (1) an energy product with a constant rate of delivery over specified intervals of time, and
- (2) an option energy product the transfers a right (*capability*) to a further transaction for the energy itself.

MARKET PRODUCTS	DESCRIPTION
1.0 Transactive Products	Products defined in TeMIX White Paper
1.1 Constant Power Energy	Energy delivered at a fixed rate (MW) over an interval
1.2 Option For Constant Power Energy	Call or Put Option for Constant Power

Rather than specifying separate AC and DC products an DC/AC attribute could be added. Voltage level 220, 5 kv 12 kv, 500 kv, etc is another such attribute.

2. Power Contract Products

In today's power markets there a many "standard" contracts that can be modeled as products in eMIX. Some of these contracts can be implemented with products 1.1 and 1.2. However is also convenient to also explicitly identify contracts and products such as the following:

MARKET PRODUCTS	DESCRIPTION
2.0 Power Contracts Products	
2.1 Full Requirements Power	A amount of energy at any rate of delivery
2.2 Full Requirements Power With Demand Charge	Above with a 15 min demand charge
2.3 Energy With Max Min Rate	Full Requirements Power with Max and/or Min Rate of Delivery
2.4 Energy Profile	A fixed profile of energy delivery over Intervals
2.5 Time of Use Pricing	A Price for Full Requirements Power that is Fixed by Time of Day
2.5 Ex-Post Real-Time Pricing	Real Time Price Published after the Intervals.
2.7 Hourly Day-Ahead Pricing	Day-Ahead Price Published after the Intervals.

3. Demand Response Products

Demand Response Products provide a *capability* to reduce consumption of energy on request. When the capability is exercised, such as in response to a DR event, the customer is requested reduce electricity usage. Any reduction in electricity usage may be measured or estimated and will result in a reduction of use of an energy product such as 1.1.

MARKET PRODUCTS	DESCRIPTION
3.0 Demand Response Products	
3.1 Demand Response Resource	A contract with a customer for curtailment
3.2 Critical Peak Pricing	A contract with a customer with high prices at critical times and lower other costs
3.3 Peak-Time Rebate Pricing	A contract with a customer with a rebate for demand response
3.4 Demand Response Customer Offer	A contract with a customer who may submit offers into an ISO market.

4. Generation Capability Products

Generation Capability Products convey the capability of a generator or produce power. Exercising or dispatching this capability produces in an energy product such as 1.1. System operators accept offers for such capability and may dispatch the capability to produce an energy product.

MARKET PRODUCTS	DESCRIPTION
4.0 Generation Products	
4.1 Tolling Contract Capability	A dispatchable contract with heat rate and simplified generation properties
4.2 Single-Stage Thermal Generator Capability	A combustion turbine generator with characterized by 3-part bids, ramp rates, etc.
4.3 Multi-Stage Thermal Generator Capability	A combined cycle generator
4.4 Hydro Generator Capability	A hydro electric project with water inflows, water storage, head, generation etc.
4.5 Wind Generator Capability	A wind generator with wind generation based on wind and curtailment capability
4.6 Solar Generator Capability	A solar generator with wind generation based on wind and curtailment capability
4.7 Storage Capability	A battery / storage device that has the capability to be charged and discharged.

5. Ancillary Services Products

An ancillary service product provides a capability to an operator such as an ISO to control resources to balance energy product amounts as required.

MARKET PRODUCTS	DESCRIPTION
5.0 Ancillary Services Products	
5.1 Regulation Down	4 sec Dispatch Up
5.2 Regulation Up	4 sec Dispatch Down
5.3 Regulation Up & Down	4 sec Dispatch Up & Down Combined
5.4 Spinning Reserve	Contingency Up for Immediate Response
5.5 Non-Spinning-Reserve	Contingency Up for Response with Start up Delay

6. Transport Products

Transport products provide the capability to move energy from one location to another location on the grid.

MARKET PRODUCTS	DESCRIPTION
6.0 Transport Products	
6.1 Distribution Service	Charges and Losses for Retail Distribution
6.2 Transmission Path Service	Charges and Losses for Non-ISO Path Transmission
6.3 ISO Transmission Service	Charges and Losses for ISO Transmission
6.4 Financial Transmission Right	Financial Right for ISO Node –to-Node Congestion Service