



APX Group

Straw man proposal for Demand Side Participation (DSP)

26 June 2013

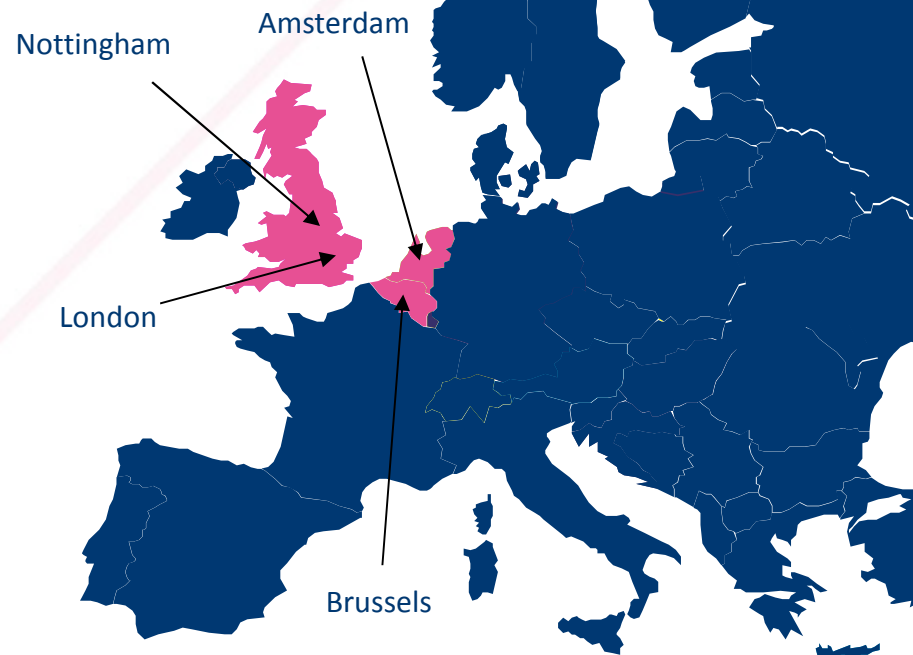
APX Today

apx power spot exchange

3 power spot markets operated in the UK, Netherlands and Belgium

86 TWh traded and cleared in 2012

Over 150 memberships across the markets from **13** countries



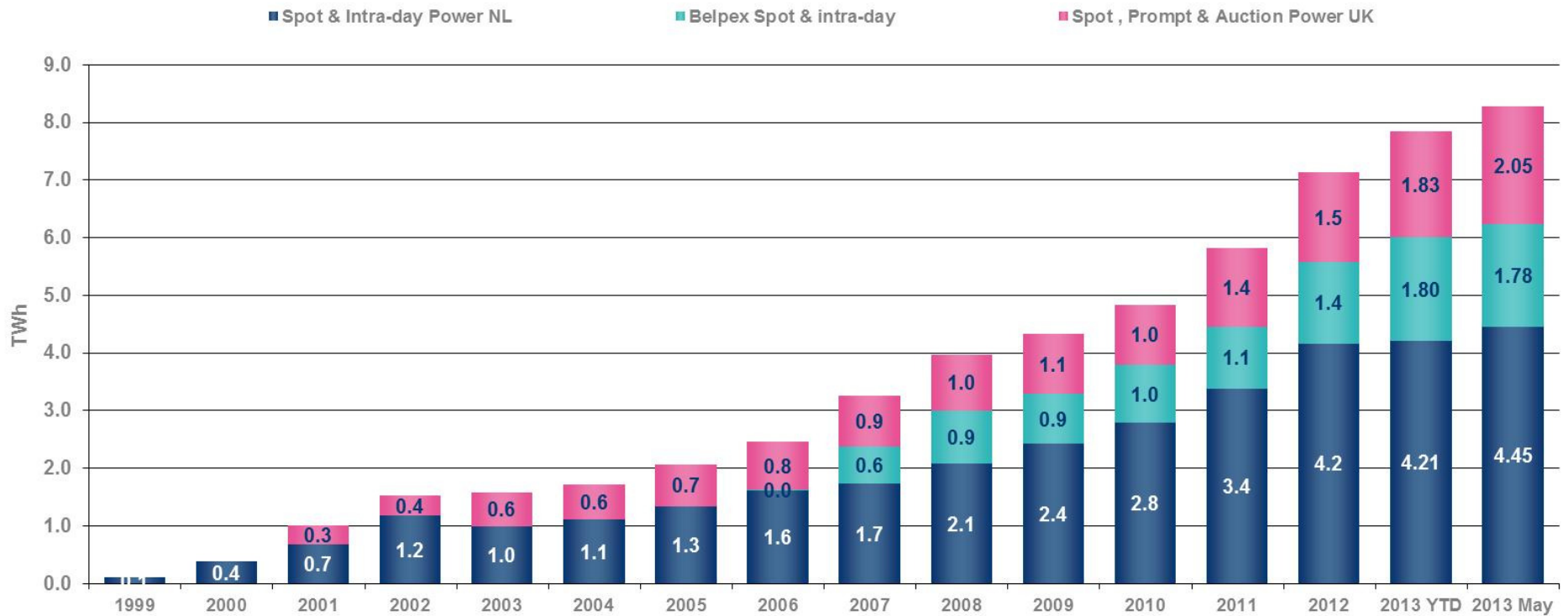
APX Services



- Spot & Prompt Market
- Day-Ahead Auction
- Third Party Notification Services
- Data Services
- OTC Broker Give-up Facility
- 24hr Operational Support
- Dedicated Account Management
- Training Services
- Direct Clearing
- Bilateral Clearing
- Nomination and Settlement Services

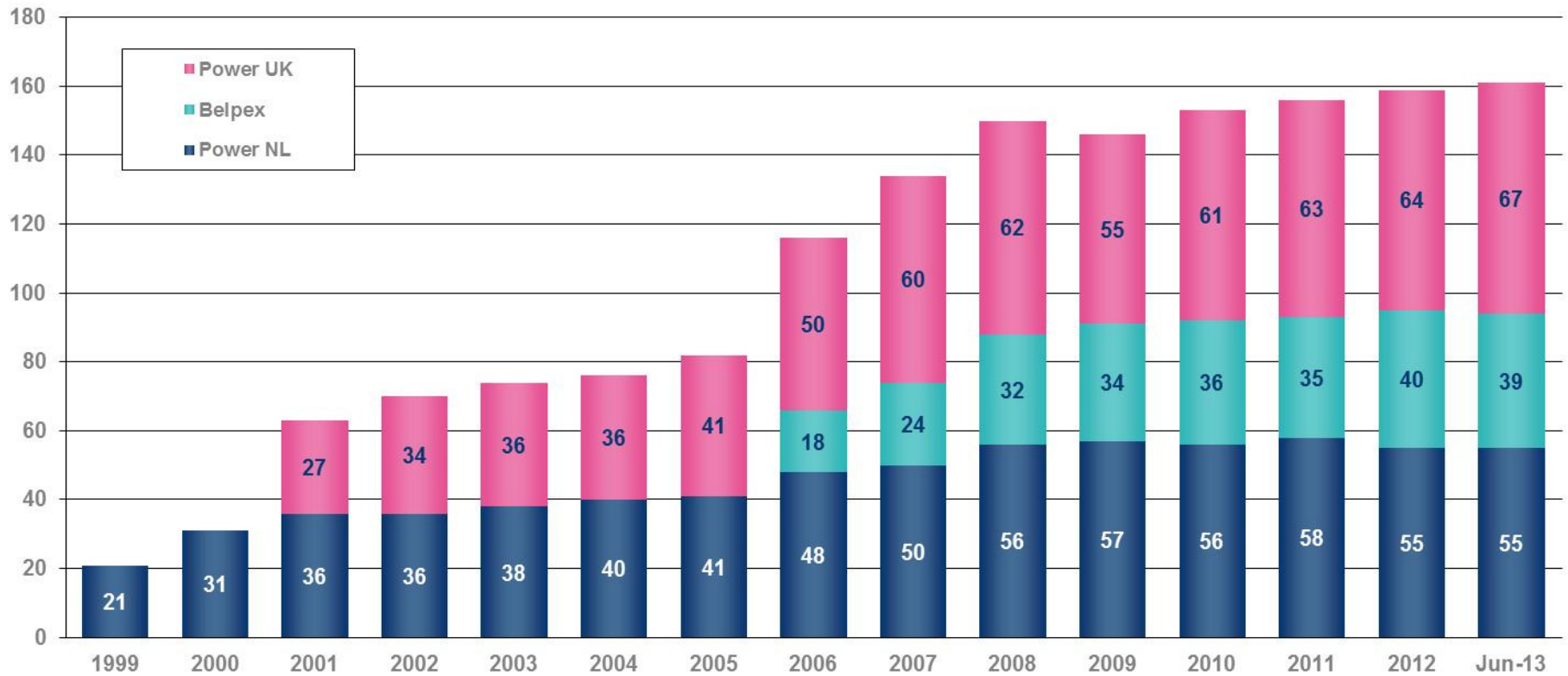
Growth in volumes

APX Group Volume, Average TWh/Month, per Market 1999 - 2013



Growth in membership

APX Group Membership per Market 1999 - 2013





Demand side participation

Problem identification

- The principle aim is to provide an opportunity for the demand side to participate in balancing the system. To date there has been limited demand side participation in the wholesale market or balancing mechanism
- A key barrier to demand side participation is that the costs outweigh the benefit. Any solution should seek to minimise the costs and should consider a support mechanism to promote participation.
- The benefit should also be maximised by allowing intraday prices to reflect the costs of balancing.
- Further barriers include the set up costs for I&C customers and the information flows between I&C customers and their suppliers
- To be successful, any proposal needs to minimise the cost of participation and be implemented in cooperation with the wider industry

APX has been working on a solution that has the potential to enable demand side participation in the wholesale market and balancing mechanism

APX - current market features

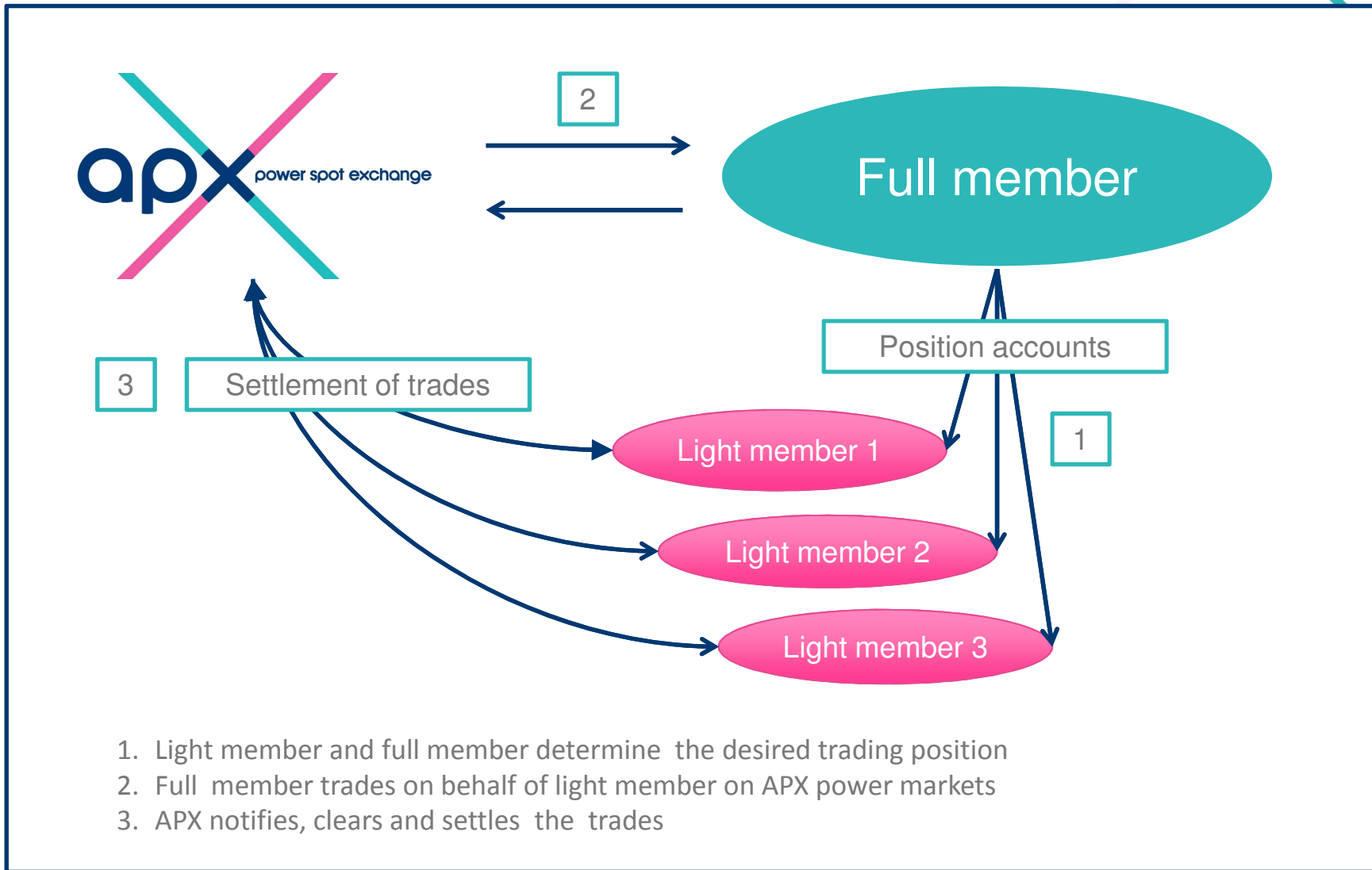
- We can provide direct access for I&C customers to the APX intraday market by creating a position account for them under their existing suppliers account
- The position account would enable the I&C customer to buy and sell power, within predefined limits, via our intraday market with any of our existing members
- As the position account would sit within the suppliers account, the I&C customer would not need to become a party to the Balancing and Settlement Code or post any additional collateral
- The supplier would also not face any additional exposure. APX systems would provide real time information on the I&C customers position to the supplier and central systems to ensure that the supplier is kept in balance
- APX operates a secure market, supported by digital password checkers to ensure authorised system access. The markets operate 24/7 and APX provided dedicated operational support. Trading is anonymous and confidential information is protected.
- National Grid is already a member of APX so can buy and sell power offered by any I&C customer with a position account

APX light membership

- Our proposal for demand side participation builds on our light membership model which has already been rolled out in the Netherlands
- I&C customers have the opportunity to join APX as light members, which means they don't have to sign up to industry codes, and faced lower membership fees than our full members
- Light membership provides I&C customers with access to our spot, prompt and auction markets and historical market data
- Light members have to post collateral and nominate their trades a full member of the exchange

APX has been working to upgrade light membership so that I&C customers don't have to post collateral and are able to trade directly on our platform

Light membership: the process



Options to enhance the market design

We see two options to introduce demand side participation:

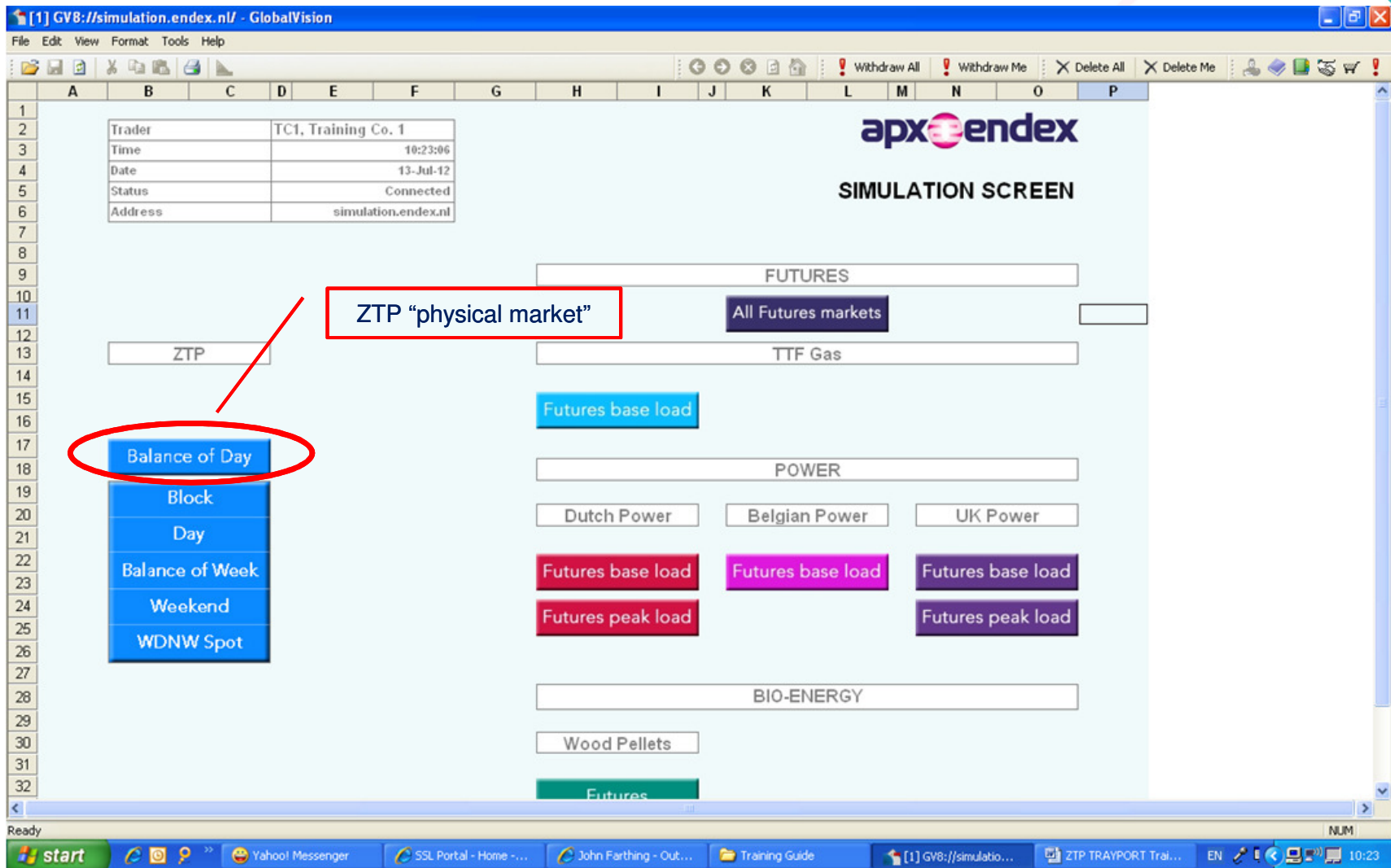
1. Current demand side participation: APX's market functionality can already enable demand to participate on the same terms as our existing members

2. Enhanced demand side participation: APX's market functionality can be augmented to include additional features considered in National Grid's proposal, such as:

- Undertake a form of tender to launch the service for I&C customers to provide a demand response service
- Develop a new demand side product or enhance the market design to include conditions specific to demand side response
 - At the start of the Belgian ZTP market, APX-ENDEX introduced a “physical market” where the TSO provided a notice of anticipated shortfall for a specific period of time and only the TSO could act as the counterparty to any offers
 - We recently responded to a Request for Information to develop a GB Flexibility Market, as part of Northern Power's Low Carbon Network Fund request for funding, with a detailed proposal to provide bespoke trading system

Our current market design already enables demands side participation. It can be enhanced to included additional features considered in National Grid's proposal.

Example 1: ZTP market screen shot



Trader: TC1, Training Co. 1
 Time: 10:23:06
 Date: 13-Jul-12
 Status: Connected
 Address: simulation.endex.nl

apx endex
 SIMULATION SCREEN

FUTURES
 All Futures markets
 TTF Gas

POWER
 Dutch Power | Belgian Power | UK Power
 Futures base load | Futures base load | Futures base load
 Futures peak load | Futures peak load

BIO-ENERGY
 Wood Pellets
 Futures

ZTP "physical market"

ZTP

Balance of Day
 Block
 Day
 Balance of Week
 Weekend
 WDNW Spot

Example 1: ZTP market screen shot

GlobalVision [1] GVB://simulation.endex.nl/ZTP BOW-BLOCK .vwb

File Edit View Format Tools Help

Withdraw All Withdraw Me Delete All Delete Me

apx endex

Trader: TC1, Training Co. 1
 Time: 10:46:47
 Date: 13-Jul-12
 Status: Connected
 Address: simulation.endex.nl

Main Page

Only the TSO can act as the counterparty

ZTP DAY						
	Qty	Bid	Ask	Qty	Last	Status
SAT 14-JUL-2012	5	20.00				Open
	5	20.00				
SUN 15-JUL-2012						Open
MON 16-JUL-2012						Open
TUE 17-JUL-2012						Open

Tradable Area

ZTP WORKING DAY NEXT WEEK						
	Qty	Bid	Ask	Qty	Last	
WK 29 2012					99,00	↔

ZTP 0600 - 0800						
	Qty	Bid	Ask	Qty	Last	Status
SAT 14-JUL-2012						24/7 Trading
SUN 15-JUL-2012						24/7 Trading

ZTP BALANCE OF WEEK TUESDAY - FRIDAY						
	Qty	Bid	Ask	Qty	Last	
TUE-FRI WK 28 2012					26,00	↓

ZTP 0800 - 2000						
	Qty	Bid	Ask	Qty	Last	Status

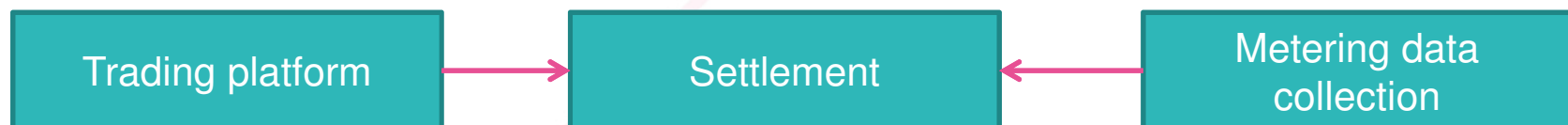
ZTP BALANCE OF WEEK WEDNESDAY - FRIDAY						
	Qty	Bid	Ask	Qty	Last	

Ready NUM

Page 6 Sec 1 6/30 At 10" Ln 22 Col 1 REC TRK EXT OVR English (U.K.) ZTP TRAYPORT Tra... EN 10:46

Example 2: GB Flexibility Market proposal

- The project aimed to develop a prototype market for the trading of flexibility services between network users, DNOs and the National Electricity Transmission System Operator
- The proposed GB flexibility market (GBFM) was complex and required the development of a secure 24/7 trading environment, a sophisticated matching algorithm, management of participant communications, settlement and clearing and required access to end user meter data on a minute by minute basis
- As a market operator, APX proposed to develop and provide the trading platform and settlement elements for the proposed GBFM. For the provision of metering data we proposed to cooperate with specialist companies in this area.



- We proposed COSMIX, a prototype developed by APX, as the matching algorithm for the GBFM. COSMIX is able to match multi-parameter orders, and consider technical and economic constraints, to discover the lowest cost despatch solution
- See Annex on COSMIX for information.

Three possible approaches

Features	Light	Current	Enhanced
I&C customers will not have access to information on any other supplier or customer	✓	✓	✓
The supplier will have real time information on its customers position	✓	✓	✓
Central systems and suppliers will automatically be notified I&C customer trades keeping the supplier in balance	✓	✓	✓
APX and the I&C customers supplier can provide assurance and training	✓	✓	✓
No additional collateral required for the I&C customer or the supplier	✗	✓	✓
I&C Customer able to buy and sell on intraday market within defined limits agreed with its supplier	✗	✓	✓
I&C customer participation launched through a form of tender	✗	✗	✓
I&C customer identified in a specific demand side account	✗	✗	✓
National Grid provide notification of system stress	✗	✗	✓
National Grid active participation on buy side at £500/MWh+ prices	✗	✗	✓

Benefits of APX proposal

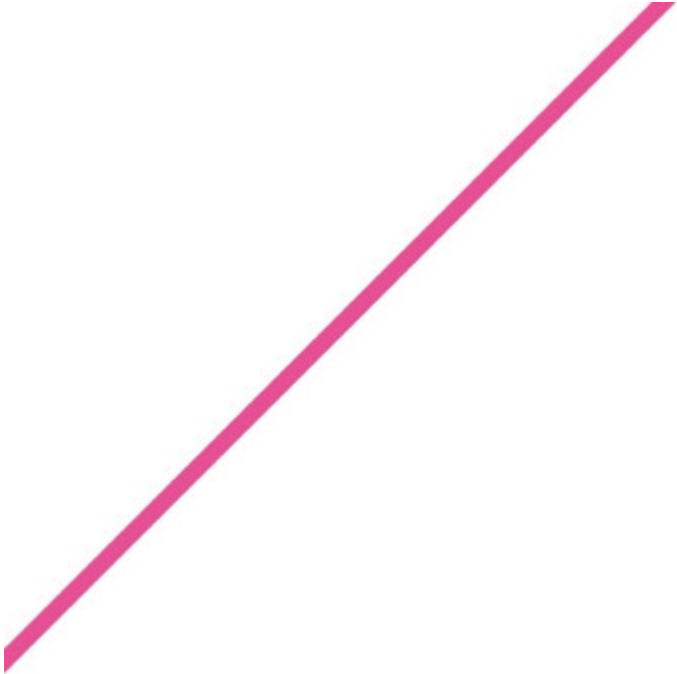
- Builds on existing contractual and service relationship between suppliers, aggregators and I&C customers – respects and enables the role of the supplier to achieved balanced positions
- Sits within existing GB trading, settlement and clearing systems which will minimise implementation costs
- National Grid does not need to establish any new products, contracts, tender process or a direct relationship with I&C customers - as these tools and processes already exist in APXs market
- I&C customers do not need to post additional collateral to be able to trade on their Position Account
- Offered demand side response can be accessible to all market participants and National Grid up until gate closure
- Can be implemented in a phased approach, building on our existing capability to develop an enhanced solution for demand side participation

The proposal is relatively cheap and easy to implement. It builds on existing industry processes. Support from wider industry still critical to success.

Conclusions

- APX's existing market design is able to facilitate demand side participation in our intraday market with minimal disruption and can be enhanced to include features of National Grid's proposal
- We have experience of introducing similar arrangements in other markets, however success would be dependant on cooperation with National Grid, suppliers and aggregators
- The key barrier to all demand side participation for I&C customers and suppliers is whether the financial benefit to participate outweigh the cost
- The main costs for an I&C customer with APXs solution are, the process to register and manage the Position Account, staff and training costs, and the cost of the trading link and additional information tools
- The benefits are that the solution builds on existing industry processes and relationships and enables I&C customers to participate in the wholesale market or provide National Grid with specific balancing services

To overcome the initial set up costs and build a base for a future enhanced service, a support mechanism could be considered to promote DSP on our intraday market



DISCLAIMER – the information contained in this document (“Presentation”) has been prepared by APX Group and is subject to change without notice. Copyright and intellectual property right protection exist in this Presentation and it may not be reproduced, distributed or published with any third party, in whole or in part, without the express prior written permission from APX Group. All rights are reserved. While reasonable care has been taken to ensure that the information contained wherein is true and accurate, APX Group makes no representation to its correctness, reliability or completeness including likelihood of achievement or reasonableness of any forecast, prospects, returns or statements in relation to future matters that may be contained in this Presentation. Neither APX Group nor any of its directors or employees accepts any liability in respect of the information contained in the Presentation or for any loss arising from the use of this Presentation, its contents or otherwise arising in connection with it. This Presentation does not constitute an offer, invitation or recommendation to any transaction and neither is it to be taken as any form of commitment on the part of APX Group to proceed with any transaction.

making markets work

Amsterdam
Australia Building
Hoogoorddreef 7
1101 BA Amsterdam
The Netherlands
+31 20 305 4000
+31 20 305 4001

London
6th floor
21 Southampton Row
London WC1B 5H
United Kingdom
T +44 20 7841 5600
F +44 20 7841 5601

Nottingham
Mere Way,
Ruddington Fields
Nottingham NG11 6JS
United Kingdom
T +44 115 921 7421
F +44 115 921 7420

Brussels
Boulevard de
L'Impératrice 66
1000 Brussels
Belgium
T +32 240 346 50
F +32 240 346 70