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Smart Metering Implementation Programme

Phase 1A – DCC Project
DCC Scope & Services Workstream

Meeting 1: 10 Sept 2010

Scope & Services Workstream - Subgroup Meeting 1

AGENDA

		Activity	Input	Output
10:00-10:30	**Introduction, Context & Workplan**	Personal introductions, experience sharing, overview of Phase 1A	List of members with contact details; overview slides	
10:30-11:15	**DCC 'Initial Scope' option**	Presentation of 'Initial Scope' option	Map of existing arrangements, material on 'initial scope' option	None
11:15-12:30	**'Initial Scope' teamwork**	Teamwork to identify implications of 'initial scope'	Draft context diagrams	Draft implications – work in progress
13:00-14:30	**WAN Service Levels**	Review Services Catalogue and start to define WAN service requirements	Services Catalogue and Traffic Model	Draft service requirements – work in progress
14:30-15:30	**WAN Requirements - Scenarios**	Teamwork to develop WAN functional and service scenarios	Illustrative scenarios	Draft scenarios – work in progress
15:30-15:45	**Preparation for Next meeting**	Timing, agenda, work tasks		Agenda for next meeting and allocation of work tasks

Agenda Item 1

INTRODUCTIONS, CONTEXT & WORKPLAN

Objective of the DCC Scope & Services Workstream

To provide input to our assessment of options in two key areas:

1. Scope of activities to be supported by DCC
2. Service and functional requirements of DCC's WAN

DCC Scope:

• Analysis to confirm and 'flesh out' the "initial DCC scope" as proposed in the Prospectus

• Examination of the implications of the "initial DCC scope" on existing systems and processes

• Definition of options for extending DCC scope to activities identified as "enabled by DCC over time" (principally supplier registration)

• Assessment of the costs, benefits, risks and other factors associated with the options

• Consideration of additional activities that might be included within DCC scope (e.g. data aggregation)

WAN Services:

• Definition of scenarios representing the range of options that might be adopted with regard to the service and functional requirements, and the timetable for their provision

• Presentation of evidence to assess the scenarios and delivery options including costs, benefits, risks and timing implications

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Objective of the DCC Scope & Services Workstream

To provide input to our assessment of options in two key areas:

1. Scope of activities to be supported by DCC
2. Service and functional requirements of DCC's WAN

Consultation questions – Scope:

Pros/Q9: should scope of DCC be limited initially to data access & scheduled data retrieval?

CBM/Q1: are access control, translation and scheduled data retrieval essential to DCC initial scope?

CBM/Q2: should registration be part of DCC scope, if so when?

CBM/Q3: should data processing, aggregation and storage be included in DCC scope, if so when?

CRF/Q13: are changes to elec or gas settlement needed to realise the benefits of smart metering?

CRF/Q15: does programme need to take account of other industry processes that will be affected by smart metering?
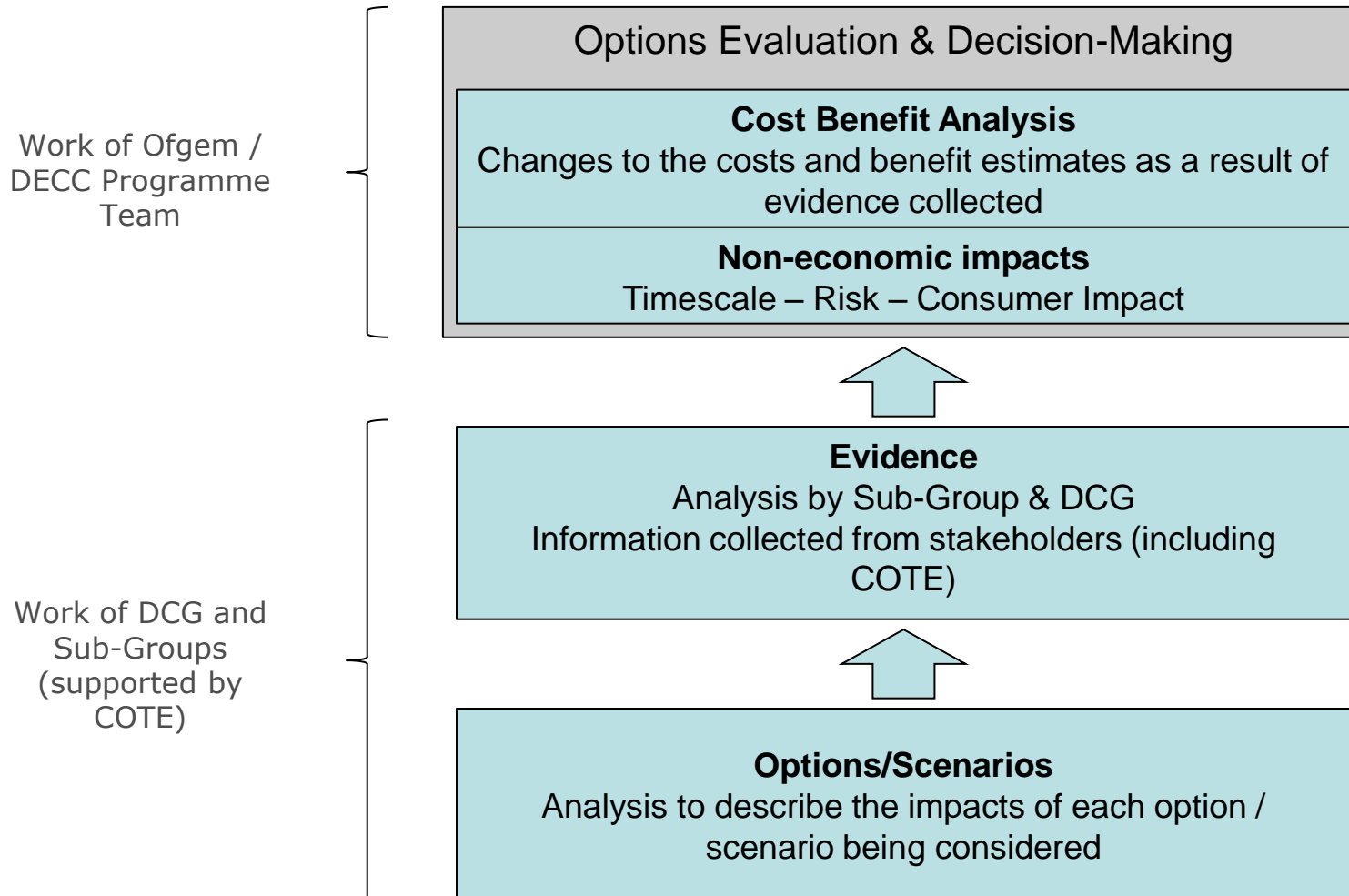
Consultation questions – WAN Services:

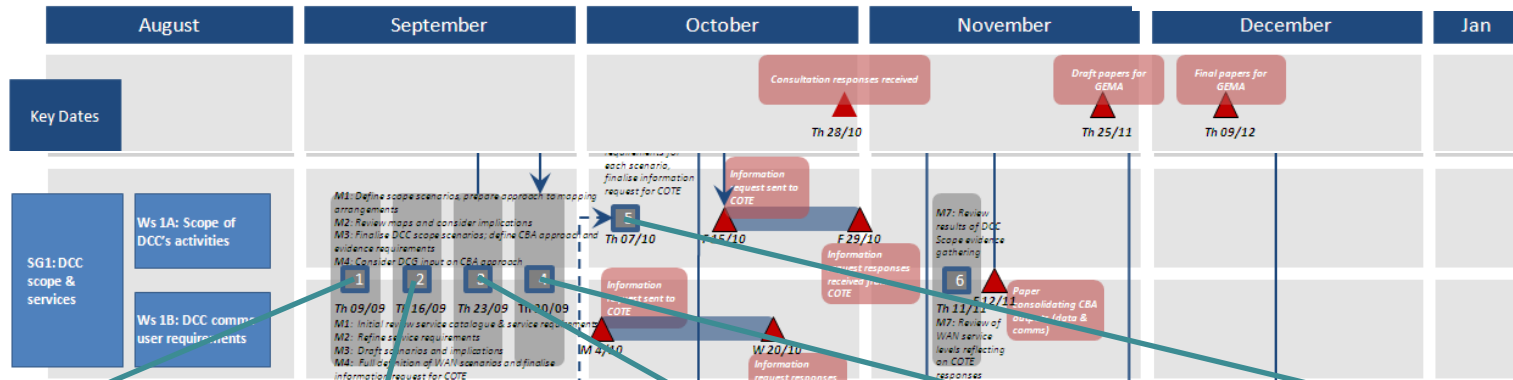SODR/Q4: is services catalogue complete?

P&S/Q2: what level of data aggregation and frequency of access is needed to fulfil regulated duties?

NonDom/Q6: does proposed approach re non-doms present limitations for smart grids?

General approach

Work of Ofgem / DECC Programme Team

Options Evaluation & Decision-Making

Cost Benefit Analysis
Changes to the costs and benefit estimates as a result of evidence collected

Non-economic impacts
Timescale – Risk – Consumer Impact

Work of DCG and Sub-Groups (supported by COTE)

Evidence
Analysis by Sub-Group & DCG
Information collected from stakeholders (including COTE)

Options/Scenarios
Analysis to describe the impacts of each option / scenario being considered

SSSG workplan

	August	September	October	November	December	Jan

Key Dates

Consultation responses received — Th 28/10

Draft papers for GEMA — Th 25/11

Final papers for GEMA — Th 09/12

SG1: DCC scope & services

Ws 1A: Scope of DCC's activities

Ws 1B: DCC comms user requirements

M1: Define scope scenarios, prepare approach to mapping arrangements
M2: Review maps and consider implications
M3: Finalise DCC scope scenarios; define CBA approach and evidence requirements
M4: Consider DCG input on CBA approach

Th 09/09   Th 16/09   Th 23/09   Th 30/09
M1: Initial review service catalogue & service requirements
M2: Refine service requirements
M3: Draft scenarios and implications
M4: Full definition of WAN scenarios and finalise information request for COTE

requirements for each scenario, finalise information request for COTE
Th 07/10   T 15/10   F 29/10

Information request sent to COTE

Information request responses received from COTE

M7: Review results of DCC Scope evidence gathering
F 12/11
Th 11/11
M7: Review of WAN service levels reflecting on COTE responses

Paper consolidating CBA (incl. data & comms)

Information request sent to COTE
M 4/10   W 20/10
Information request responses

Meeting 1	Meeting 2	Meeting 3	Meeting 4	Meeting 5
Scope • Review 'initial scope' and define options • Agree mapping approach **Services** • Review services catalogue • Define options to be analysed	**Scope** • Analyse options for bringing registration into DCC • Define information to be requested **Services** • Analyse functional and service requirements • Define information to be requested	**Scope** • Consider options linked to registration • Prepare briefing for DCG **Services** • Document services scenarios for presentation to DCG	**Scope** • Consider inclusion of other activities (i.e. DP / DA) **Services** • Finalise information request	**Scope** • Prepare information request for approval by DCG

DCC Scope - we will build on the evidence gathering in April/May and the options presented in the Prospectus

		Comms & Access Control	Security Monitoring & Assurance	Translation	Initial Smart Grid Requirements	Scheduled Data Retrieval	Meter Registration	Data Storage on CoS	Data Processing	Data Aggregation	Smart Grids - Evolved Reqts	Consumer Value Added Services	Extra-Industry Services	Supplier Volume Allocation
Evidence Gathering - April	Option A	■		■										
	Option B	■		■		■	■		■	■				
	Option C	■		■		■	■		■	■			■	
Prospectus CBM	Initial Scope (Grey)	■	■	■	■	■								
	Additional Services (Black)	■	■	■	■	■	■	■		■	■			
	Further Possibilities (White)	■	■	■	■	■	■	■	■	■	■	■		

The 'Initial Scope' in the Prospectus reflects Option A1/2 or A+ as presented by several respondents to the Evidence Gathering request – adding Scheduled Data Retrieval

Consumer Value-Added Services	Data Aggregation & Storage
Extra-Industry Services	Data Processing
Smart Grid (evolved requirements)	Change of Supplier Data
Smart Grid (initial requirements)	Meter Registration
Translation Services (Head Ends)	Scheduled Data Retrieval
Secure Communications & Access Control A set of communication technology solutions and corresponding contacts enabling national coverage, coupled with a secure access control function	

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WAN functional and service requirements – we will build on the Prospectus and work within the programme to define scenarios for assessment

Performance

- Network Availability
- Latency

- Other indicators

Traffic Volumes

- Message size
- Collection frequency
- Number of meters

Commercials

- Contract duration
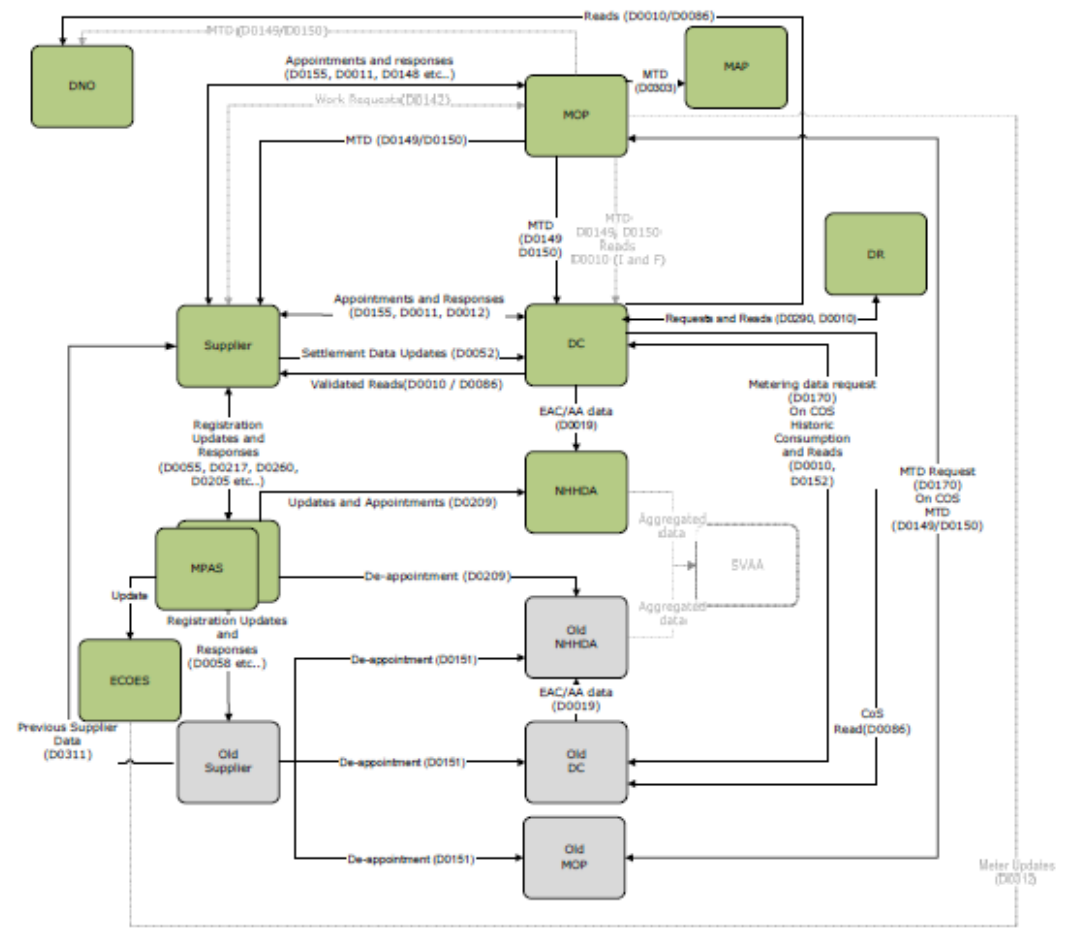- Risk allocation
  - Service performance
  - Credit risk

Agenda Item 2

DCC ACTIVITIES – 'INITIAL SCOPE' OPTION

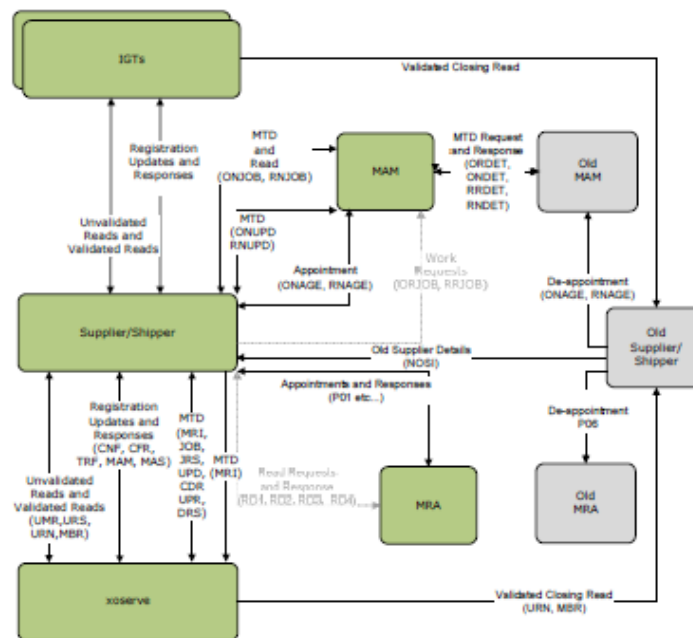## Smart Metering Context Models
As is Electricity
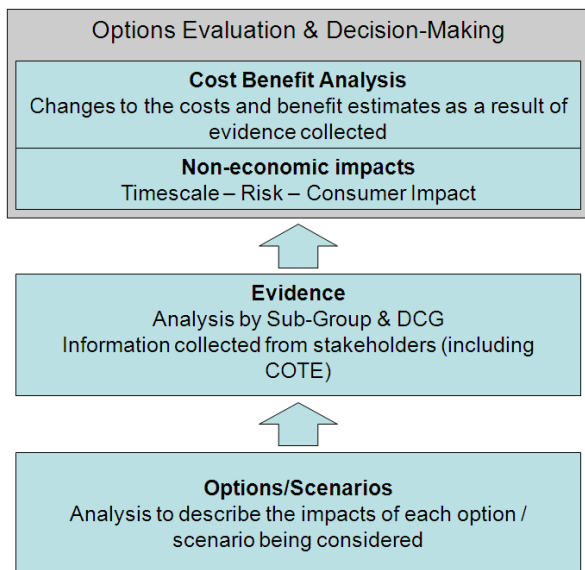

The starting point is the 'as is' arrangements

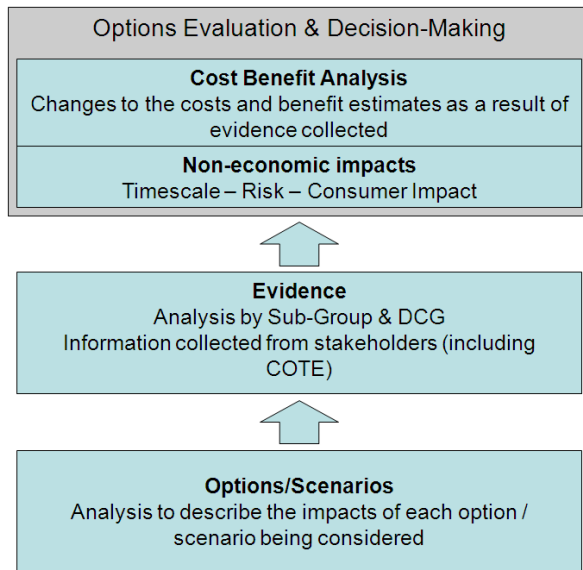## Smart Metering Context Models
As is Gas

Options must be described in a way that assists evidence collection – step one is to identify the affected parties

Options Evaluation & Decision-Making

Cost Benefit Analysis
Changes to the costs and benefit estimates as a result of evidence collected

Non-economic impacts
Timescale – Risk – Consumer Impact

Evidence
Analysis by Sub-Group & DCG
Information collected from stakeholders (including COTE)

Options/Scenarios
Analysis to describe the impacts of each option / scenario being considered

We need to estimate time, cost and other implications of each option / scenario on:

Party	Potential Implications under 'Initial Scope' Option
DCC (set-up)	Systems architecture, means of accessing MP registers
Suppliers	Changes to handle SM functions, processes for handling smart and trad in parallel, CoS (including data exchanges with agents)
DNOs / GTs / IGTs	Changes to new connections processes, CoS and other registration activities, introduction of smart grid functions
Messaging Systems (DTN / UK Link)	Changes / additions to market messages, volume and service level changes, parallel handling of smart and trad
xoserve	Changes to CoS and other registration activities
Elexon	Any changes?

Need to develop a common framework for describing the options

Initial scope – illustration for discussion

Column headers (diagonal):
Comms & Access Control, Security Monitoring & Assurance, Translation, Initial Smart Grid Requirements, Scheduled Data Retrieval, Meter Registration, Data Storage on CoS, Data Processing, Data Aggregation, Smart Grids - Evolved Reqts, Consumer Value Added Services, Extra-Industry Services, Supplier Volume Allocation

Initial Scope (Grey)												

Options Evaluation & Decision-Making

Cost Benefit Analysis
Changes to the costs and benefit estimates as a result of evidence collected

Non-economic impacts
Timescale – Risk – Consumer Impact

↑

Evidence
Analysis by Sub-Group & DCG
Information collected from stakeholders (including COTE)

↑

Options/Scenarios
Analysis to describe the impacts of each option / scenario being considered

DCC's systems portfolio?	As above (functions & data to be defined)
How will DCC access registration data for access control?	Mirrored version of SCOGES/ECOES (access arrangements to be defined)
Changes to change of supplier arrangements?	No changes other than to identify a MP as 'smart'
Changes to new connection procedures?	No changes
Method of message transfer between DCC & users?	Continued use of DTN & UK Link (changes to be defined)
Changes required to settlement arrangements?	No changes to gas. For electricity smart meters may be designated as HHM
Which smart grid services are to be supported?	Ad hoc power quality data and status alarms
Which data will be managed by DCC?	WAN configuration – nodes, devices etc and 'lead supplier' only. All other data managed as currently (see next slide)

To expand on some of the functions that were listed above …

Access Control	Translation & Messaging	Scheduled Data Retrieval
• Authorised parties will be parties to SEC: 　• suppliers 　• network operators 　• energy service co's • Each type of party will be restricted to a defined set of services • DCC will authorise requests by reference to: 　• ECOES / SCOGES for suppliers (or MPAS/SPAS) 　• network area for NOs 　• accreditation records for ESCO's	• Transformation between proprietary protocols used to communicate with meters and "standard messages" exchanged between DCC and parties • Validation of requests (e.g. that a PAYG credit is being applied to a meter operating in PAYG mode) • Storage of transaction metadata (for charging) • Storage of other data to be analysed further	• Executing a programme of scheduled meter reads • Executing 'diarised events' received from parties (e.g. to update tariffs on a specified date) • Managing the 2-way flows of transactions between DCC and HAN so as to optimise network performance

Preliminary analysis of data that DCC will need to manage

Data to manage comms network and transaction flows

• Node 'address' for WAN module (comms address not spatial)
• Meter point identifier (MPAN / MPRN)
• Device identifiers on HAN (meters, IHD, other equipment)
• Meter type (to identify protocol for transactions)
• Meter registers
• Comms Service ID (to identify WAN service provider)

Data identifying supplier responsible for WAN

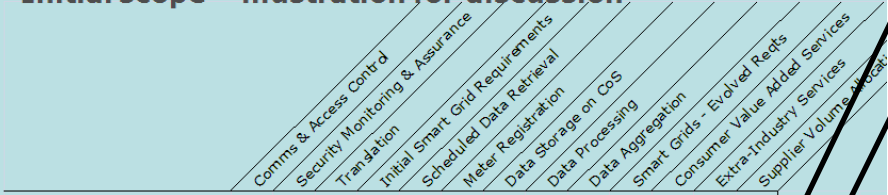• Identifier showing gas or electricity as 'lead supplier' in event of fuels supplied separately

Other data

• All other data should be accessed from existing industry sources (for initial scope option)
• Meter reads and other private data will not be stored by DCC (except where 'buffering' is needed to improve operational efficiency)

Areas where analysis is required to flesh out option descriptions

Initial scope – illustration for discussion

Column headers (diagonal): Comms & Access Control, Security Monitoring & Assurance, Translation, Initial Smart Grid Requirements, Scheduled Data Retrieval, Meter Registration, Data Storage on CoS, Data Processing, Data Aggregation, Smart Grids - Evolved Reqts, Consumer Value Added Services, Extra-Industry Services, Supplier Volume Allocation

Initial Scope (Grey)

Question	Answer
DCC's systems portfolio?	As above (functions & data to be defined)
How will DCC access registration data for access control?	Mirrored version of SCOGES/ECOES (access arrangements to be defined)
Changes to change of supplier arrangements?	No changes other than to identify a MP as 'smart'
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Which smart grid services are to be supported?	Ad hoc power quality data and status alarms
Which data will be managed by DCC?	WAN configuration – nodes, devices etc and 'lead supplier' only. All other data managed as currently (see next slide)

Systems architecture for DCC

Industry systems context diagrams (mapped against existing arrangements)
Impact analysis on existing market messages

Smart grid analysis – requirements (and benefits)

ELEXON model
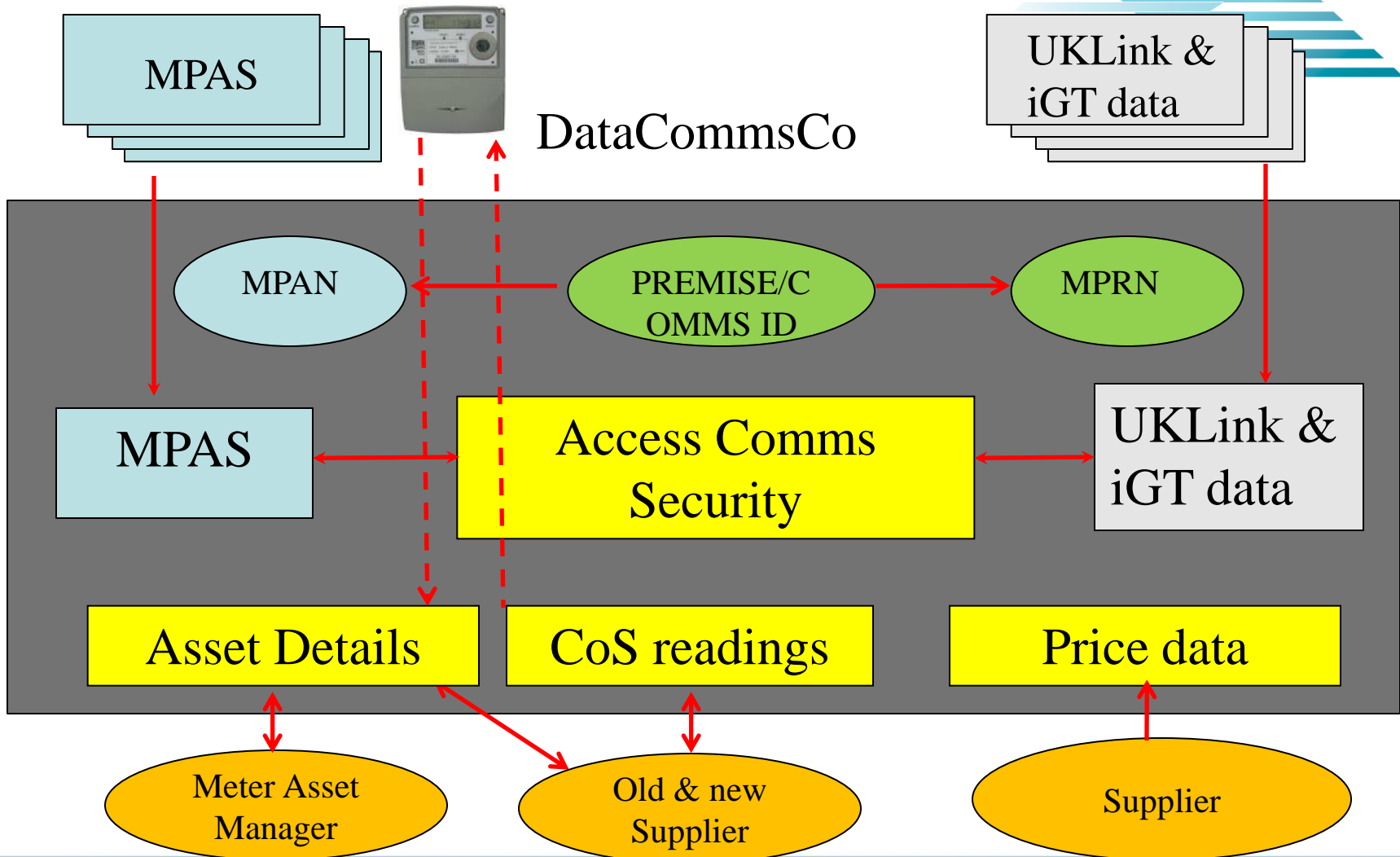
Key features

- Just as ECOES provides a web-based window onto MPAS/SMRS data & IAD onto UKLink/iGT data, the DCC could provide a window onto MPAS and UKLink

- Registration data would be synchronised with legacy systems each night

- DCC would hold its own access & security and comms referenced by a Premise Id

- Premise Id would be linked to MPRNs and MPANs when smart meters installed.

- Access to meters and data would be controlled by Registration details

- Users would view all data (which they were entitled to view) via a web-based front end

- MPAS & UKLink data would still be viewable for dumb meters (searchable by MPAN or MPRN)

- Supports later migration from a "virtual" single database to an actual single database

xoserve Potential Model
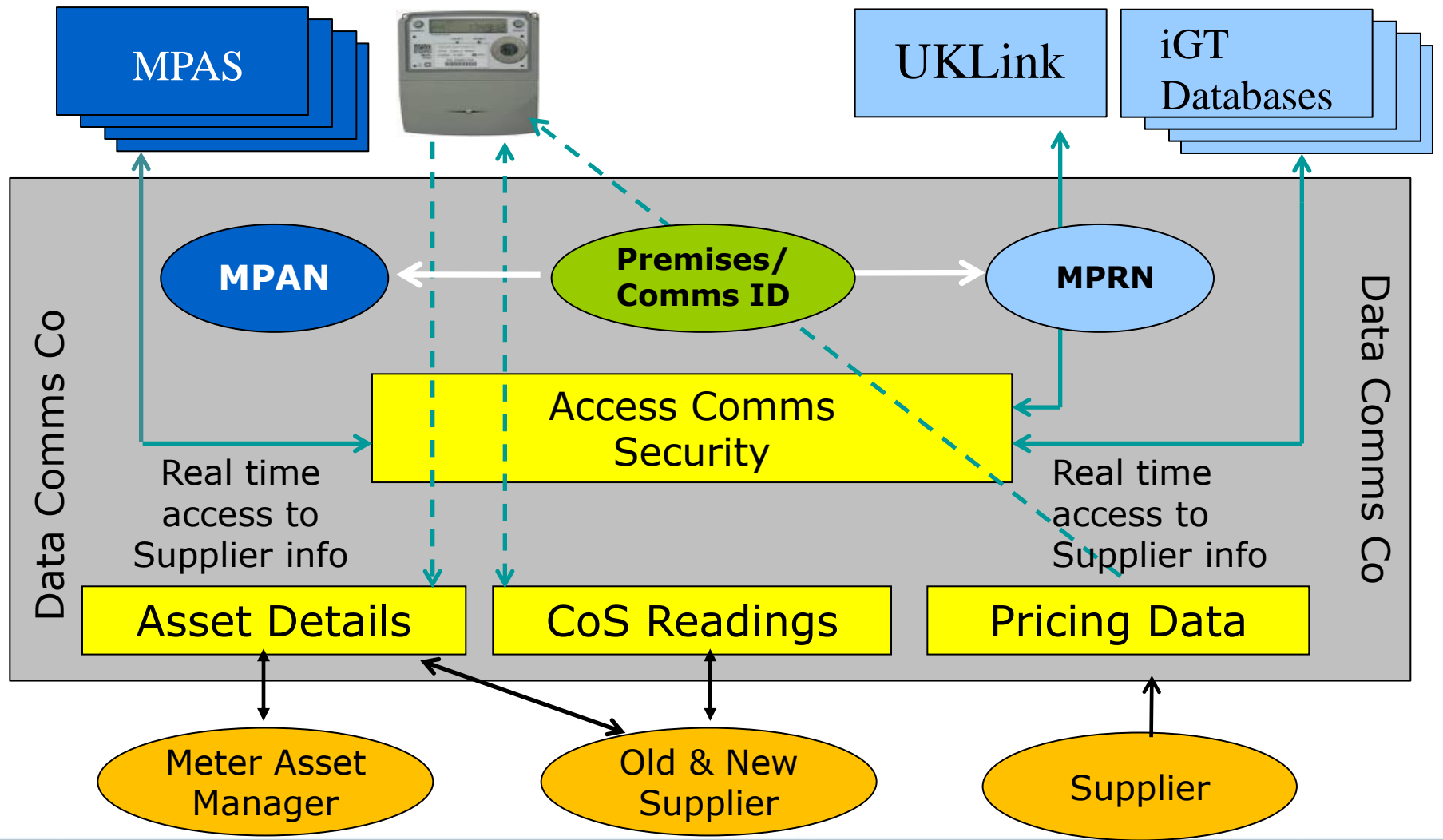
Key to xoserve's Potential Model
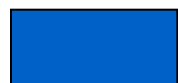
▮ (blue)	Electricity processes & data
▮ (light blue)	Gas electricity & data
▮ (green)	DCC processes & data
▮ (yellow)	Supplier or their Agents
▮ (grey)	Data Comms Co

→ Supplier & their agents process flows

- - -→ Flows to & from the smart meter

→ Flows to & from industry databases

⬛→ Link between MPAN, MPRN & Premises/Comms ID
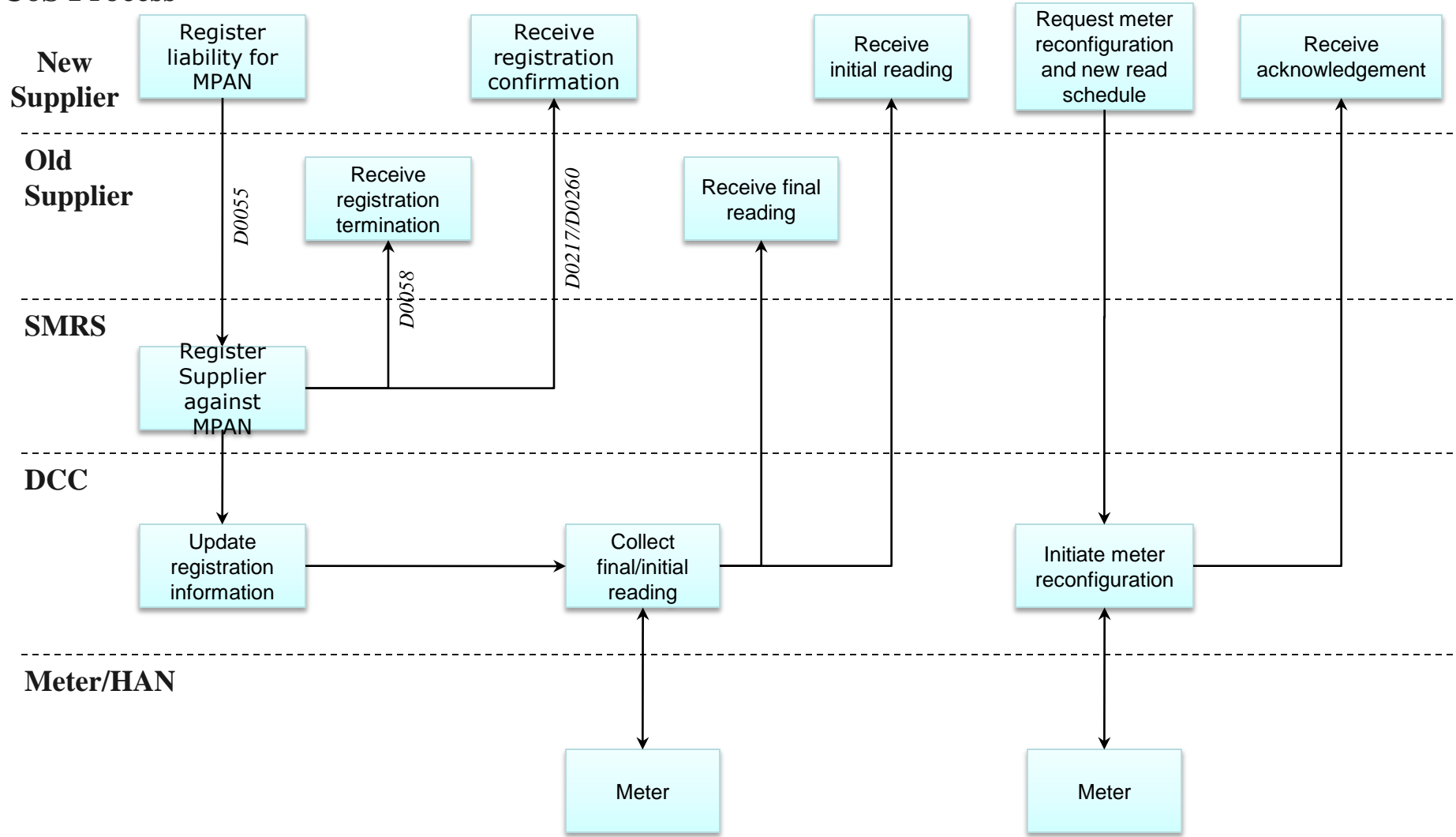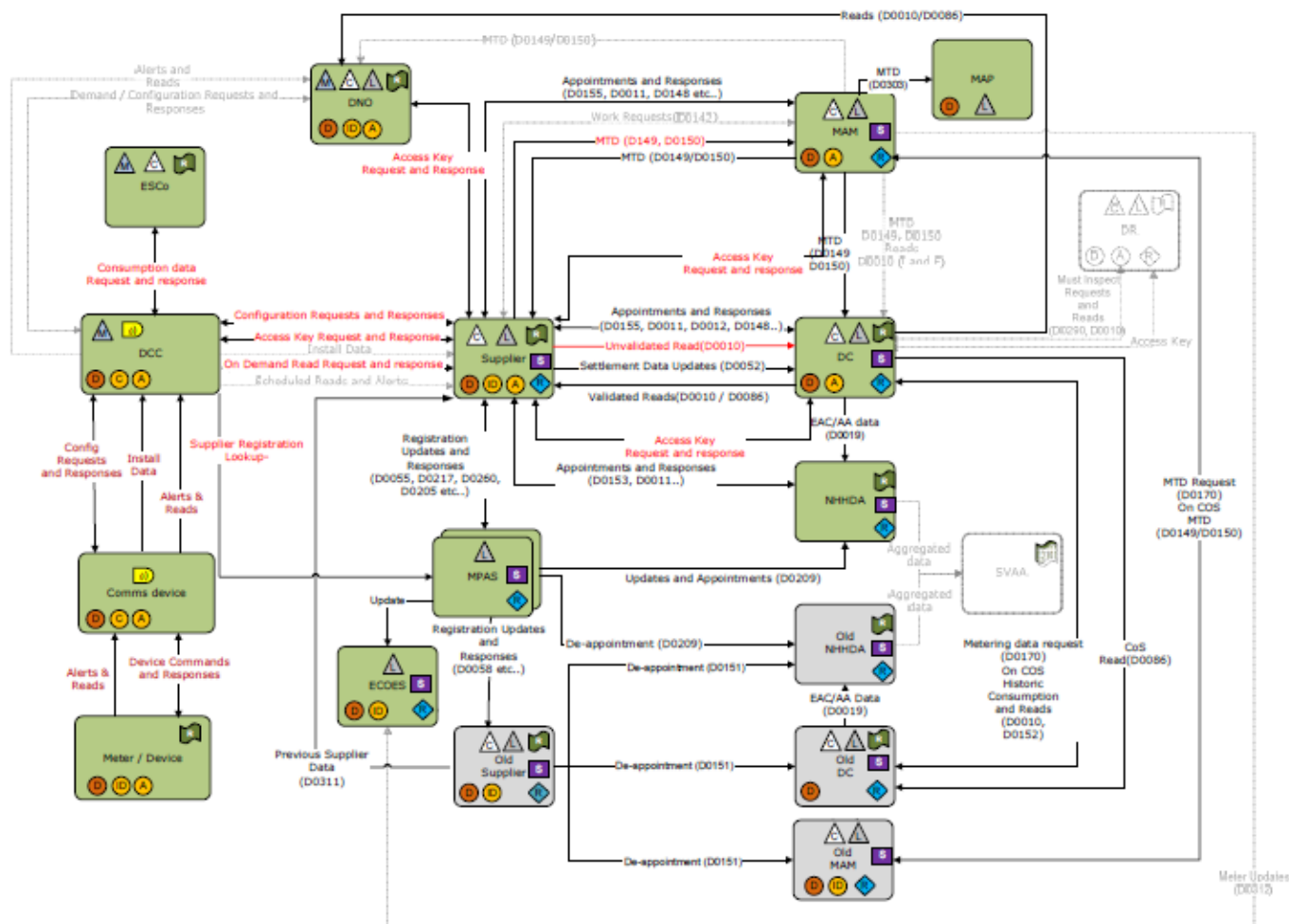
xoserve Potential Model Key Points

- The potential model has been developed based on a set of high level assumptions that need to be tested and reviewed to reach a consensus view at an appropriate level of detail for each scenario

Pre-Requisites
- SSSG1 needs to define DCC's data requirements & responsibilities
- What data items does DCC need to access and/or store
- What data does DCC need to make available & to whom

Considerations
- Consider technical feasibility & security issues
- Consider the pros & cons of duplicate data held by central registrations systems & DCC

How it might work
- DCC would have direct read only access to the gas & electricity registration databases (separate for GTs & iGTs)
- Same logical design as Elexon, but different physical implementation
- Supports enhancement to CoS reads processes for use by the industry

CoS Process

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New Supplier

- Register liability for MPAN
- Receive registration confirmation
- Receive initial reading
- Request meter reconfiguration and new read schedule
- Receive acknowledgement

Old Supplier

- Receive registration termination
- Receive final reading

SMRS

- Register Supplier against MPAN

DCC

- Update registration information
- Collect final/initial reading
- Initiate meter reconfiguration

Meter/HAN

- Meter
- Meter

D0055
D0058
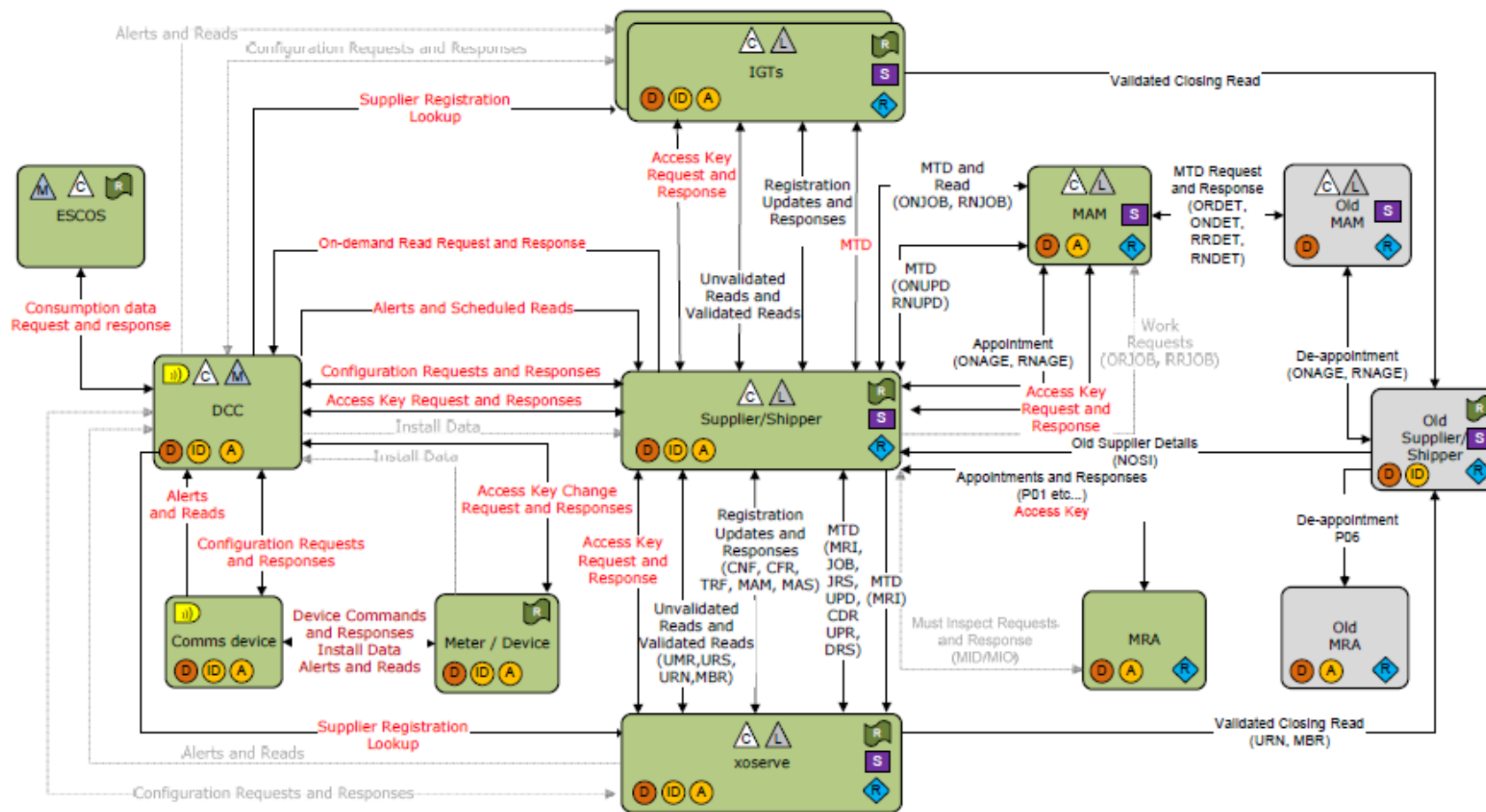*D0217/D0260*

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Smart Metering Context Models

Interpretation of Initial Scope as per Prospectus (Electricity)

Smart Metering Context Models

Interpretation of Initial Scope as per Prospectus (Gas)

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Agenda Item 3

TEAMWORK – IMPLICATIONS OF 'INITIAL SCOPE'

Time to start working – split into two teams (G & E)

Each team to consider draft context maps under 'initial option' and:

• Review accuracy / completeness of maps at a 'strategic level'

• Identify where the most significant changes will be required to existing industry arrangements

• Prepare very high level 'architecture' diagram for DCC systems

Agenda Item 4

WAN SERVICE LEVELS

We need to define a set of scenarios which represent plausible permutations of WAN requirements

Performance

- Network Availability
- Latency

Electricity meter specific	Size bytes inc. padding	Max response secs	kbps calc
Meter reading - sim	102	60	0.0
Meter reading - inte	384	60	0.1
Tariff setting	102	60	0.0
Meter alerts	102	8	0.1
PPM balance/ top-	102	8	0.1

Gas meter specific	Size bytes inc. padding	Max response secs	kbps calc
Meter reading - sim	102	60	0.0
Meter reading - inte	384	60	0.1
Tariff setting	102	60	0.0
Meter alerts	102	8	0.1
PPM balance/ top-	102	8	0.1

General and operational services - G&E	Size bytes inc. padding	Max response secs	kbps calc
Diagnostics	102	8	0.1
Message to IHD	256	8	0.3
Firmware upgrade	400,096	60	53.3

Smart Grid - electricity	Size bytes inc. padding	Max response secs	kbps calc
Electricity quality re	53,664	1	429.3
Appliance load mar	98	8	0.1

Smart Grid - gas	Size bytes inc. padding	Max response secs	kbps calc
Appliance load mar	98	8	0.1

Microgen	Size bytes inc. padding	Max response secs	kbps calc
Microgen read	282	60	0.0
Microgen tariff upd	102	60	0.0

- Other indicators

Traffic Volumes

- Message size
- Collection frequency
- Number of meters

Information Terabytes Generated (TB) 2012-2030 - High Scenario

- Microgen
- Smart Grid - gas
- Smart Grid - electricity
- General and admin - G&E
- Gas-specific
- Electricity specific
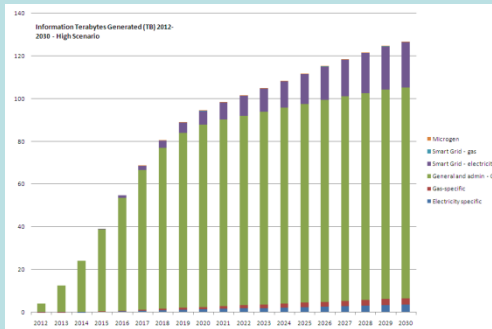
Commercials

- Contract duration
- Risk allocation
  - Service performance
  - Credit risk

Services Catalogue

• Services Catalogue specifies the services that DCC will be obliged to support – to be set out in Smart Energy Code

• DCC performance will be measured against Service Level Agreements (SLAs) for each service

• SLAs will therefore influence the design of the WAN and the price that DCC charges for providing each service

• SLAs must be set at a level that can be justified in DECC's GB Impact Assessment

Our first task is to define WAN performance requirements

Time to start working (again)

- **Divide into 2 teams**

- **Each team to review the network performance levels specified in the Traffic Model (30 mins)**

  - **Identify minimum performance level required for smart metering**

  - **Identify an 'enhanced' service level and the rationale why such a level might be required and/or justified**

  - **Also, identify services which are missing or need clarification**

- **Feedback to group (15 mins)**

Agenda Item 5

**WAN FUNCTIONAL & SERVICE REQUIREMENTS –
SCENARIO DEVELOPMENT**

We need to define a set of scenarios which represent plausible permutations of WAN requirements

Performance

- Network Availability
- Latency

- Other indicators

Traffic Volumes

- Message size
- Collection frequency
- Number of meters

Commercials

- Contract duration
- Risk allocation
  - Service performance
  - Credit risk

Approach to scenario development

CBA must cover the full economic life of the solution (as per DECC IA)

For evidence to be useful it must:
• relate directly to the scenario being tested
• be comparable between 'experts'

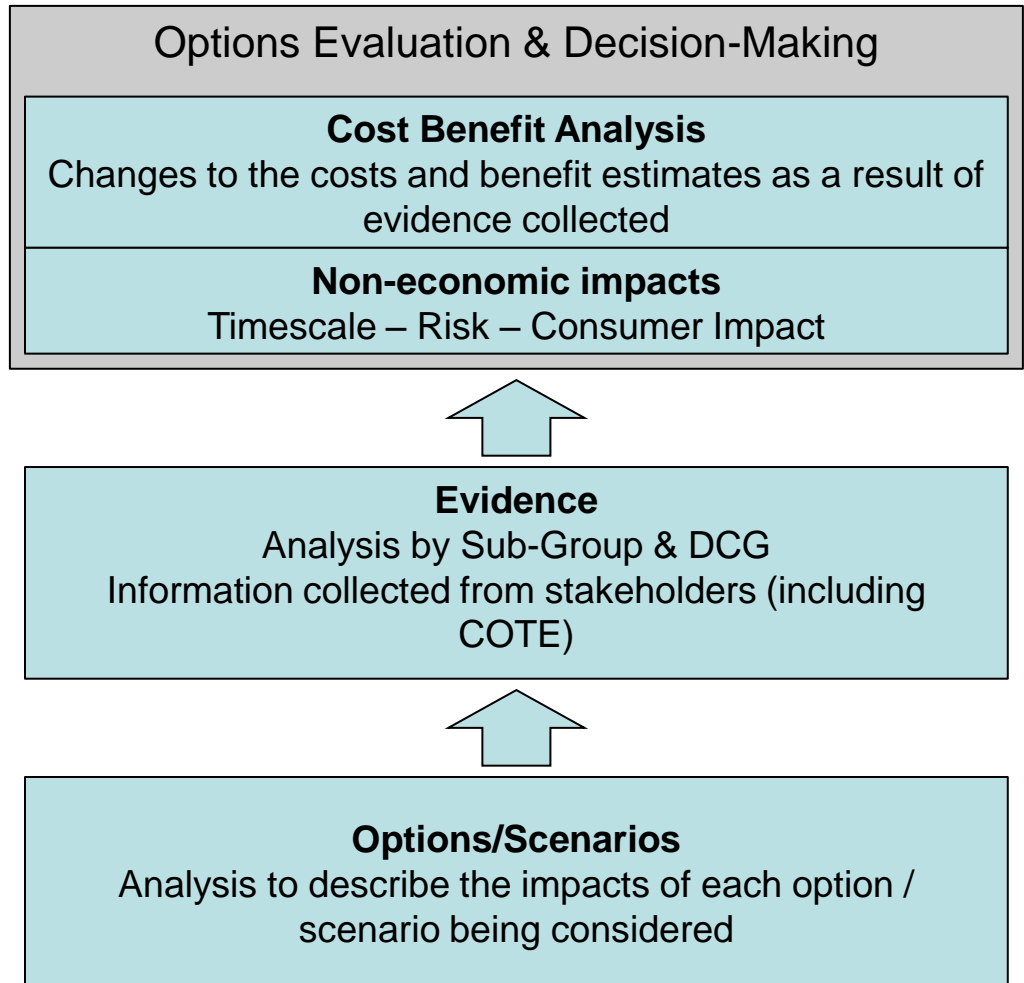Therefore the scenarios must be:
• realistic and meaningful
• clearly differentiated
• specified to a level of detail that will support evidence gathering

Options Evaluation & Decision-Making

Cost Benefit Analysis
Changes to the costs and benefit estimates as a result of evidence collected

Non-economic impacts
Timescale – Risk – Consumer Impact

Evidence
Analysis by Sub-Group & DCG
Information collected from stakeholders (including COTE)

Options/Scenarios
Analysis to describe the impacts of each option / scenario being considered

Illustrative WAN scenarios to promote discussion

WAN Services			
	Network Performance	**Traffic Volumes**	**Commercials**
1 Permanent 'smart metering' service level and minimum data volumes	'Low'	Monthly collection (unless requested by customer) and register read (unless TOU tariff)	5 year contract with 'soft' penalties for performance failures
2 Strategic network built to meet forseeable requirements for Smart Grids (incl. DSM)	'High'	Daily collection of HH data for all meters	10 year contract with 'hard' penalties for performance failures
3 Start with 'tactical' network to meet first wave of rollout – then upgrade to 'smart grid' level	Low at Go Live – replaced with High in [2018]	Initial 'low' performance WAN procured on 5 year contract, replaced by 'high' performance WAN on 10 year contract (cost estimates must include visit to replace WAN module)	

Time to start working

- **Divide into 2 teams**

- **Each team to review the draft scenarios from previous slide**

- **Each team to develop 3-4 scenarios building on the drafts**

Agenda Item 6

NEXT MEETING

Agenda for second meeting (16 Sept)

Prep Work

Scope
• Further development of context maps

Services
• Review / update of 'traffic model'

Meeting 2

Scope
• Analyse options for bringing registration into DCC
• Define information to be requested

Services
• Analyse functional and service requirements
• Define information to be requested

Outputs

Scope
• Definition of options to be evaluated
• Outline of Information Request

Services
• Definition of scenarios
• Outline of Information Request