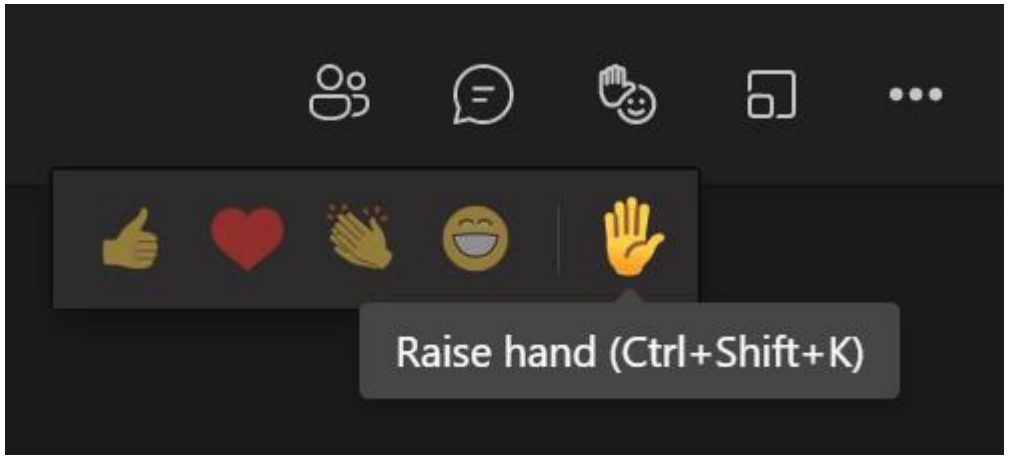
P442 Digital Meeting Etiquette

- Welcome to the P442 Workgroup meeting 2 – we'll start shortly
- No video please to conserve bandwidth
- Please stay on mute unless you need to talk – use the Raise hand feature in the Menu bar in Microsoft Teams if you want to speak, or use the Meeting chat



- Talk – pause – talk
- Lots of us are working remotely – be mindful of background noise and connection speeds

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P442 ‘Reporting to EMRS of chargeable volumes for SVA Metering Systems that record both exempt and licensed supply’

Meeting 2

24 May 2023

Meeting Agenda

Objectives for this meeting:

- Agree whether P442 solution should allow for multiple Suppliers
- Agree whether P442 solution should consider network losses
- Agree process for the application of LLFs
- Agree whether CVA should be included in the P442 solution
- Discuss consumer impacts

Agenda Item	Lead
1. Welcome and meeting objectives	Ivar Macsween – Chair
2. Calculations Options	John Lucas – Market Design Advisor
3. Process Options	Lorna Lewin – Market Design Advisor
4. New Role Options	Jenny Sarsfield – Lead Analyst
5. Consumer Impacts	Jenny Sarsfield and Somayeh Taheri – Urban Chain, Proposer
6. Next steps	Jenny Sarsfield
7. Meeting close	Ivar Macsween

RECAP OF MEETING 1

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Recap of Workgroup Meeting 1

- Elexon presented the background to P442, and the WG agreed with the Issue 96 WG's justifications for recommending the P442 solution
- WG identified that CVA systems are not included in the solution and questioned whether this should be considered
- WG felt that HHDC **should not** be mandated to share data with ESCA, as it could be shared by Suppliers and reliance on HHDCs could slow development and adds a dependency with the MHHS Programme
- Discussed responsibility for ensuring the 5MW limit on exempt supply is adhered to, with an initial view that this should not be for Elexon to 'police'
- WG agreed that the solution should be applicable to HH capable meters
- Discussed if ESCA should be a Supplier Agent or a BSC Party
- A WG member questioned whether the ESCA could apply the LLFs instead of SVAA
- WG considered how ESCA should receive data - DTN, DIP, or a method agreed with Supplier
- It was agreed that any issues to interoperability would be more efficiently dealt with under a separate Modification Proposal
- The WG expressed concerns about the credit implications of the proposed Energy Imbalance Adjustment, with some feeling it should not be included in P442, as it requires central system changes and is not required for correct reporting to EMRS

Action Updates

Ref	Action	Latest Update	Owner	Due
1.1	Create diagrams to visualise the solution option(s)	Proposed closed - Diagrams with solution options have been prepared and will be presented in WG2	Elexon	WG2
1.2	Conduct Impact Assessments for the P442 proposed solution	Ongoing - Impact Assessment to be undertaken once solution options decided upon in WG2	Elexon	WG3
1.3	Create worked examples for the Imbalance adjustment proposal	Proposed closed - Worked examples for the Imbalance adjustment have been created and will be presented in WG2	Elexon	WG2

CALCULATION OPTIONS

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P442 Calculation Options

Two specific areas to consider:

1. Are we calculating exempt supply volumes only for purposes of reporting to EMRS? Or should we also adjust Suppliers' Imbalance Volumes?

   This question relates to whether P442 is intended to support arrangements with a single licensed Supplier, or multiple licensed Suppliers

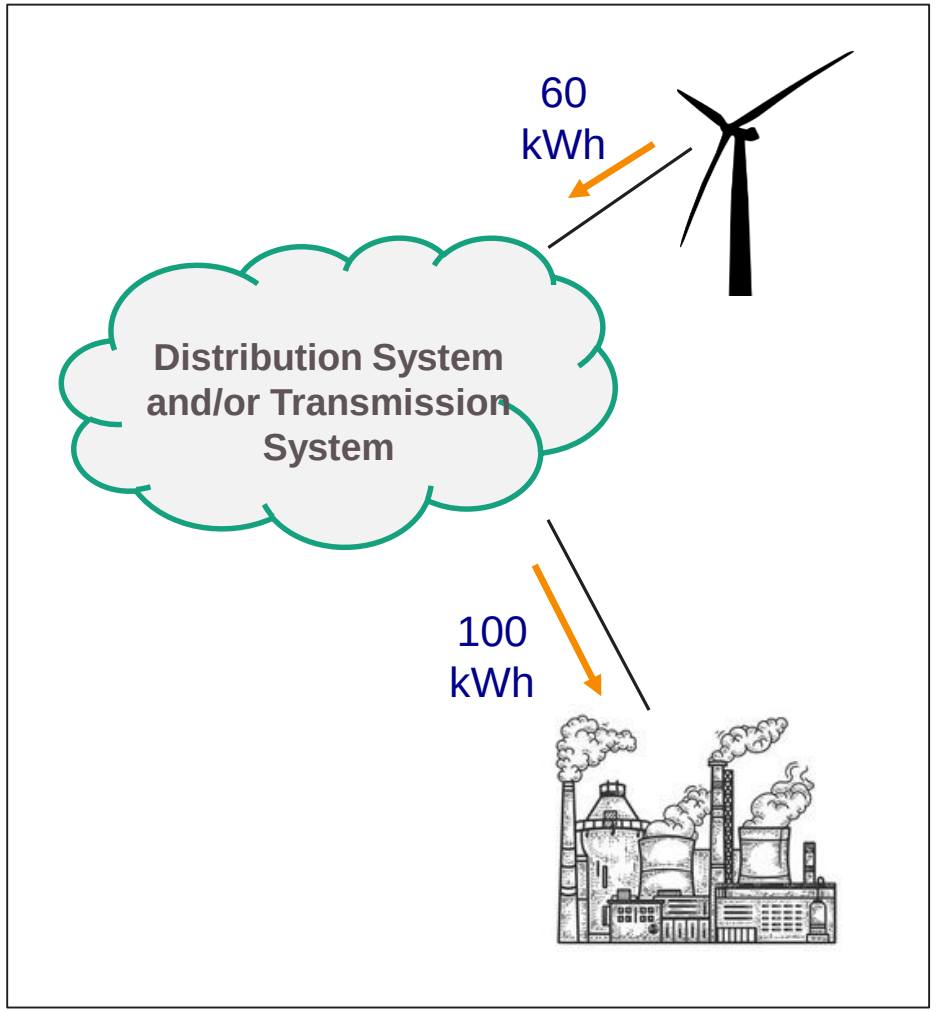
2. To what extent should we require the ESCA to take into account network losses (on Distribution System and Transmission System)?

Example with a single licensed Supplier

Consider an agreement between:

1. A generator (acting as an exempt supplier);
2. A customer (taking an exempt supply from the generator);
3. A Licensed Supplier, facilitating the arrangement by:
   - Registering Metering Systems for both supplier and generator
   - Buying any Export ‘spill’ that the generator can’t supply to the customer
   - Providing any Import ‘top-up’ that the customer can’t buy from the exempt supplier; and
4. An ESCA, submitting exempt supply volumes to Settlement

Because a single licensed Supplier is facilitating both sides of the exempt supply, the customer can’t change their top-up Supplier unless the generator changes their supply arrangements also.



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Example with a single licensed Supplier: summary of cash flows

The role of the ESCA is to determine exempt supply volumes (in line with instructions from parties involved):

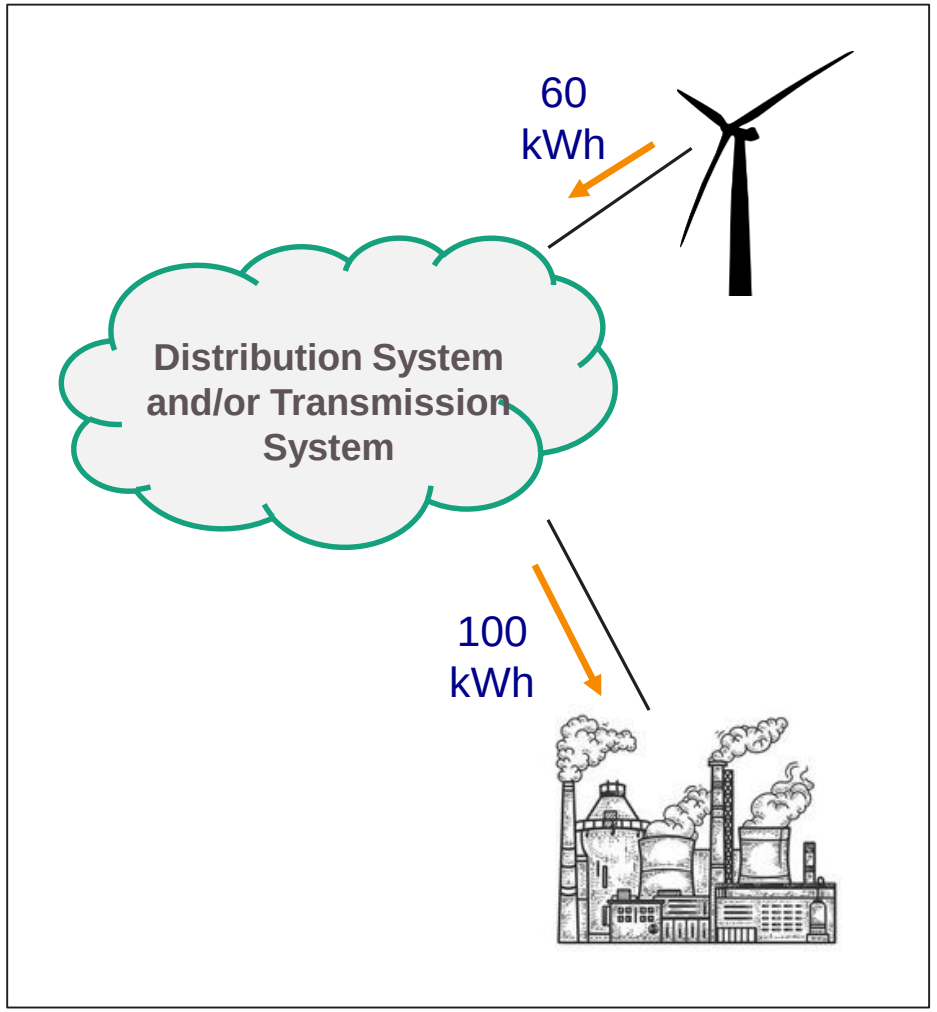
	Exempt supply	Licensed (top-up) supply
Customer	60 kWh	40 kWh

This calculation must feed through into:

- Customer billing (60 kWh purchased from exempt supplier, 40 kWh top-up supply); and
- Levy payments (60 kWh not subject to RO, CFD and CM levies)

In this single-Supplier scenario, Imbalance does not need to be adjusted (because both sides of the exempt supply are on the same Supplier Energy Account, and cancel out)

(For now we're ignoring the complexity of distribution and transmission losses, but we'll get to those later.)



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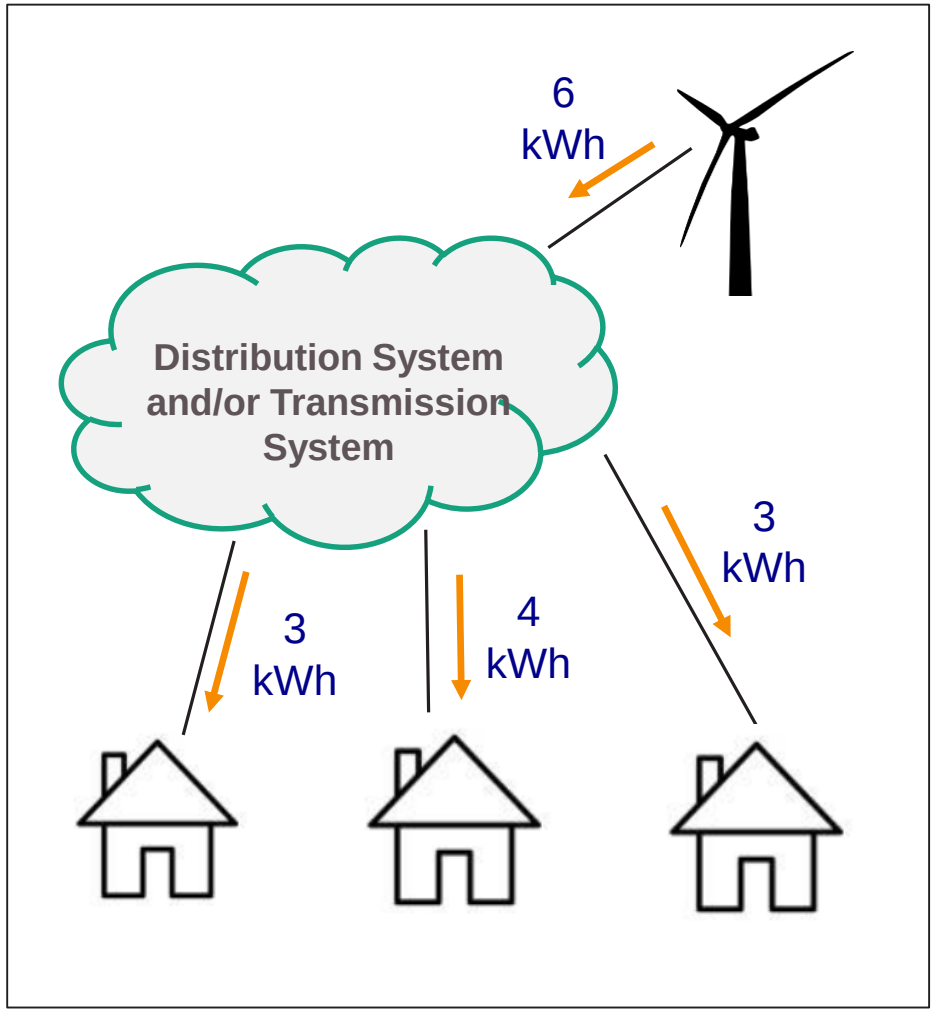
Example with multiple licensed Suppliers

Consider a scenario with:

1. A renewable generator (wanting to make an exempt supply to local households);
2. An ESCA
3. Multiple Suppliers who have agreed to work with the ESCA and provide top-up supply (but are independent of each others)
4. Customer of those Suppliers, who wish to buy some of their energy from the generator (as an exempt supply)

In this scenario the customer can change their top-up Supplier, without impacting the generator's offtaking arrangements, provided the new Supplier is one of those working with the ESCA



Example with multiple licensed Suppliers: summary of cash flows

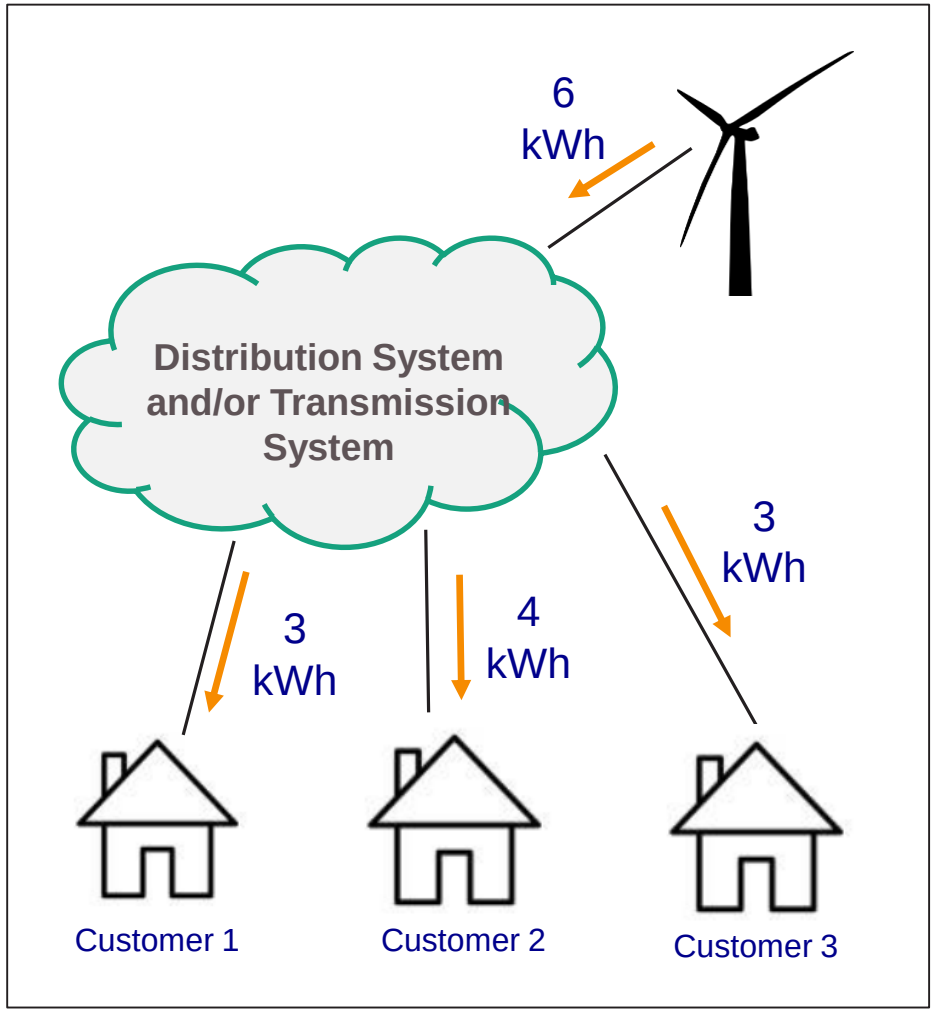
The ESCA will determine exempt supply volumes (in line with instructions from parties involved):

	Exempt supply	Licensed (top-up) supply
Customer 1	3 kWh	0 kWh
Customer 2	3 kWh	1 kWh
Customer 3	0 kWh	3 kWh

If we don't adjust the imbalance positions, the Suppliers involved will incur Imbalance Charges as a result of facilitating the exempt supply (and have to pass those costs on to customers):

- Generator's supplier will be long 6 kWh
- Customer 1's supplier will be short 3 kWh
- Customer 2's supplier will be short 3 kWh

To avoid this we would need to reflect the ESCA allocations in Imbalance Settlement (transferring 3 kWh to each of the customers' suppliers, from the generator's supplier)



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How would the algebra work (in Section T)?

If the Workgroup want us to apply Imbalance Adjustments, the SAA would need to receive exempt supply volumes by Import BMU and Export BMU. In the previous example:

Import BMU (i1)	Export BMU (i2)	BM Unit Exempt Supply Volume ($QBES_{i1i2j}$)
Customer 1's Supplier BMU	Generator's Supplier BMU	0.003 MWh
Customer 2's Supplier BMU	Generator's Supplier BMU	0.003 MWh

For purposes of EMRS reporting, we can aggregate up to the Import BMU level:

$$\text{TLM-Adjusted BM Unit Gross Demand} = -\underline{TLM_{ij}} * (\text{BM Unit SVA Gross Demand} - \Sigma_{i1=i}\, QBES_{i1i2j})$$

For purposes of Imbalance adjustment, we need to calculate a net volume of exempt supply sold by each Energy Account:

$$QAES_{aj} = \underline{TLM_{ij}} * (\Sigma_{i2 \in a}\, QBES_{i1i2j} - \Sigma_{i1 \in a}\, QBES_{i1i2j})$$

And then include this in the calculation of Account Energy Imbalance Volumes:

$$QAEI_{aj} = QACE_{aj} - QABS_{aj} - QABC_{aj} - QAES_{aj}$$

N.B. above equations assume that $QBES_{i1i2j}$ values provided to SAA are not TLM-adjusted. If ESCA was applying transmission losses (see later slides) SAA would not apply TLM again.

Options for Imbalance Settlement

Solution Options	Pros	Cons
No Imbalance Adjustments	• Requires (slightly) less change in Settlement system	• Solution does not adequately support schemes involving multiple independent licensed Suppliers (as they would incur significant Imbalance Charges) • This may limit the development of exempt supply arrangements and limit supply competition for customers using them
Imbalance Adjustments	• Allows schemes to involve multiple independent licensed Suppliers	• Requires (slightly) more functionality in Settlement system

- Are there any other pros and cons we should note?

Discussion Points

- Should the P442 solution allow multiple Suppliers?
- Should the P442 solution include and Imbalance adjustment for multiple Suppliers?

SHOULD THE ESCA TAKE LOSSES INTO ACCOUNT?

Should the ESCA take losses into account?

Suppose an exempt supplier generates 1 kWh. Should that allow them to supply 1 kWh to a customer? Or should losses be taken into account, so the amount they supply is slightly less than (or more than) 1 kWh?

Our suggested approach to addressing this question is:

- Recap how it would work for licensed supply (i.e. the generator sells their 1 kWh to a licensed Supplier, who sells it to the customer)
- Try to apply a consistent approach to exempt supply, provided it doesn't impose disproportionate burdens on exempt suppliers and ESCAs (noting that exempt supply is intended to avoid the burdens of complying with Codes and Licences)

How are losses handled for Licensed Suppliers? (1 of 2)

Suppose a licensed Supplier buys 1 kWh from a generator, and supplies it to a customer:

Type of Electrical Loss	Treatment in Settlement
Distribution Losses	If the customer and generator are connected at the same voltage level in the same GSP Group, they will have the same Line Loss Factor (LLF). This means the losses cancel out, and 1 kWh of generation can supply 1 kWh of demand. But if the customer and generator have different LLFs, there will be a net adjustment: • Generator LLF = 1.10, Customer LLF = 1.12, each kWh of generation supplies 0.982 kWh of demand • Generator LLF = 1.12, Customer LLF = 1.10, each kWh of generation supplies 1.018 kWh of demand
Locational Transmission Losses	If the customer and generator are in the same Zone (GSP Group), they will have the same Transmission Loss Factor (TLF). This means the TLFs cancel out. If the customer and generator are in different Zones, there will be a net adjustment: • Generator TLF = -0.01, Customer TLF = +0.01, each kWh of generation supplies 0.980 kWh of demand • Generator TLF = +0.01, Customer TLF = -0.01, each kWh of generation supplies 1.020 kWh of demand

How are losses handled for Licensed Suppliers? (2 of 2)

Suppose a licensed Supplier buys 1 kWh from a generator, and supplies it to a customer:

Type of Electrical Loss	Treatment in Settlement
Variable Transmission Losses	If the customer and generator are both embedded in a Distribution System, they will both have the same Transmission Losses Adjustment (TLMO), so no net adjustment. If the generator is transmission-connected and the customer is distribution-connected there will be a net adjustment • Generator $TLMO^{+}$ = -0.01, Customer $TLMO^{-}$ = +0.01, each kWh of generation supplies 0.980 kWh of demand

This treatment of losses can appear counter-intuitive, because it reflects the physics, not the contracts:

- For example, suppose a generator in London supplies a customer in Scotland
- The generator's kWh are **not** reduced to reflect nominal losses incurred in transporting electricity from London to Scotland, because that's not what physically happens (irrespective of what their contract says)
- Instead their kWh are likely to be increased, to reflect the reduction they (generator in London, customer in Scotland) are making to overall system losses

How is the P441 Workgroup proposing to handle losses?

Modification P441 supports “Class 5 Complex Sites” for local exempt supply (beneath a primary substation). The process of determining exempt supply volumes is performed by the HHDC rather than the ESCA.

For reference, the P441 Workgroup’s proposed approach to losses can be summarised as follows:

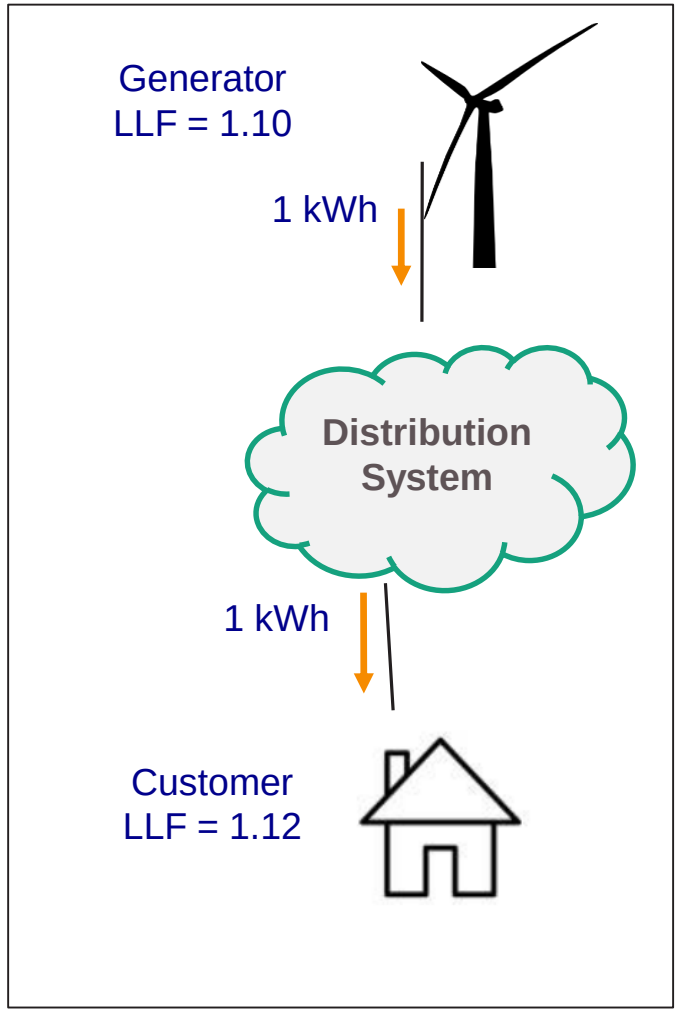
Type of Electrical Loss	Treatment in Settlement
Distribution Losses	HHDC not required to account for differences in LLF (to avoid disproportionate complexity)
Locational Transmission Losses	Not relevant (as customer and generator will always be in same GSP Group).
Variable Transmission Losses	Not relevant (as customer and generator will always be in same GSP Group).

What happens if the ESCA doesn't consider LLF differences when matching demand and generation?

Consider the ultra-simple example of 1 kWh generation and 1 kWh demand (see diagram).

If we allow the ESCA to calculate exempt supply volumes using Unadjusted metered data (as per P441), Settlement will apply the LLFs **after** the ESCA has determined the exempt supply volume:

- ESCA identifies 1 kWh of exempt supply from generator to customer
- This will be reflected in the customer's bill, which will say the entire 1 kWh of their demand was exempt supply (no top-up required)
- Someone (ESCA or SVAA) applies LLFs to the volumes (generator = 1.10 kWh, customer = 1.12 kWh)
- 1.12 kWh of (LLF-adjusted) exempt supply reported to EMRS



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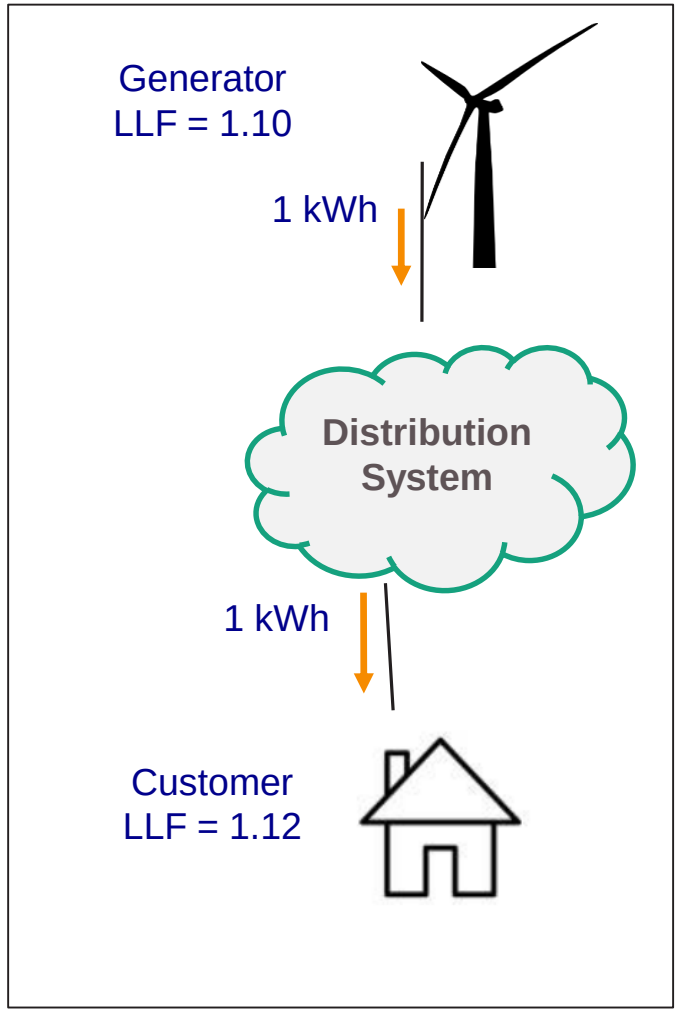
And if the ESCA does consider LLF differences when matching demand and generation?

To handle losses ‘correctly’ (like licensed supply), the ESCA would apply LLFs **before** matching demand and generation:

- ESCA applies LLFs to the volumes (generator = 1.10 kWh, customer = 1.12 kWh)
- ESCA identifies 1.10 kWh of (LLF-adjusted) exempt supply, 0.02 kWh of (LLF-adjusted) licensed supply
- ESCA would have to take the LLFs off again for purposes of reporting volumes to Supplier for customer billing purposes (0.982 kWh exempt, 0.018 kWh licensed)
- 1.10 kWh of (LLF-adjusted) exempt supply reported to EMRS



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What about transmission losses?

Similarly, we could require the ESCA to apply transmission losses (TLF and TLMO) before matching demand and generation

For example, this would reduce (by c. 2%) the amount of distribution-connected demand that a transmission-connected generator could make an exempt supply to (by allowing for variable transmission losses)

The ESCA couldn't use actual TLMO values (as they won't yet have been calculated), but they could use indicative estimates (from BMRS)

Note: if the ESCA was applying transmission losses, we wouldn't apply them again in Section T (to avoid double counting)

Options for Treatment of Losses by ESCA

Options differ in what losses (if any) the ESCA applies to demand and generation before 'matching' the values to identify exempt supply:

Option 1 – No Losses

Option 2 – LLF

Option 3 – LLF + TLF

Option 4 – LLF + TLF + ITLMO

Simpler for ESCA

More Accurate

The more 'accurate' options have the benefit of minimising small discrepancies arising from differences in generator's and customer's losses:

- Small discrepancies between exempt supply reported to EMRS, and generation recorded in Settlement
- Small residual Imbalances for Supplier(s) facilitating the exempt supply

Discussion Points

- Is the additional complexity of accounting for losses worth it for the increase in accuracy?
- Which losses should the ESCA consider when matching demand and generation?

PROCESS OPTIONS

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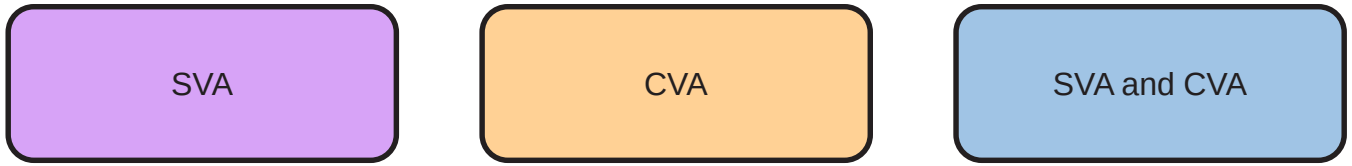
Solution Options

- There are two main solution options being considered:
  - Option 1 – SVAA / CDCA applying LLFs
  - Option 2 – ESCA applying LLFs

- These solution options may be applied to SVA and/or CVA

- The diagrams on the following slides display these options with the process steps colour coded to show which aspects are unique to SVA and CVA



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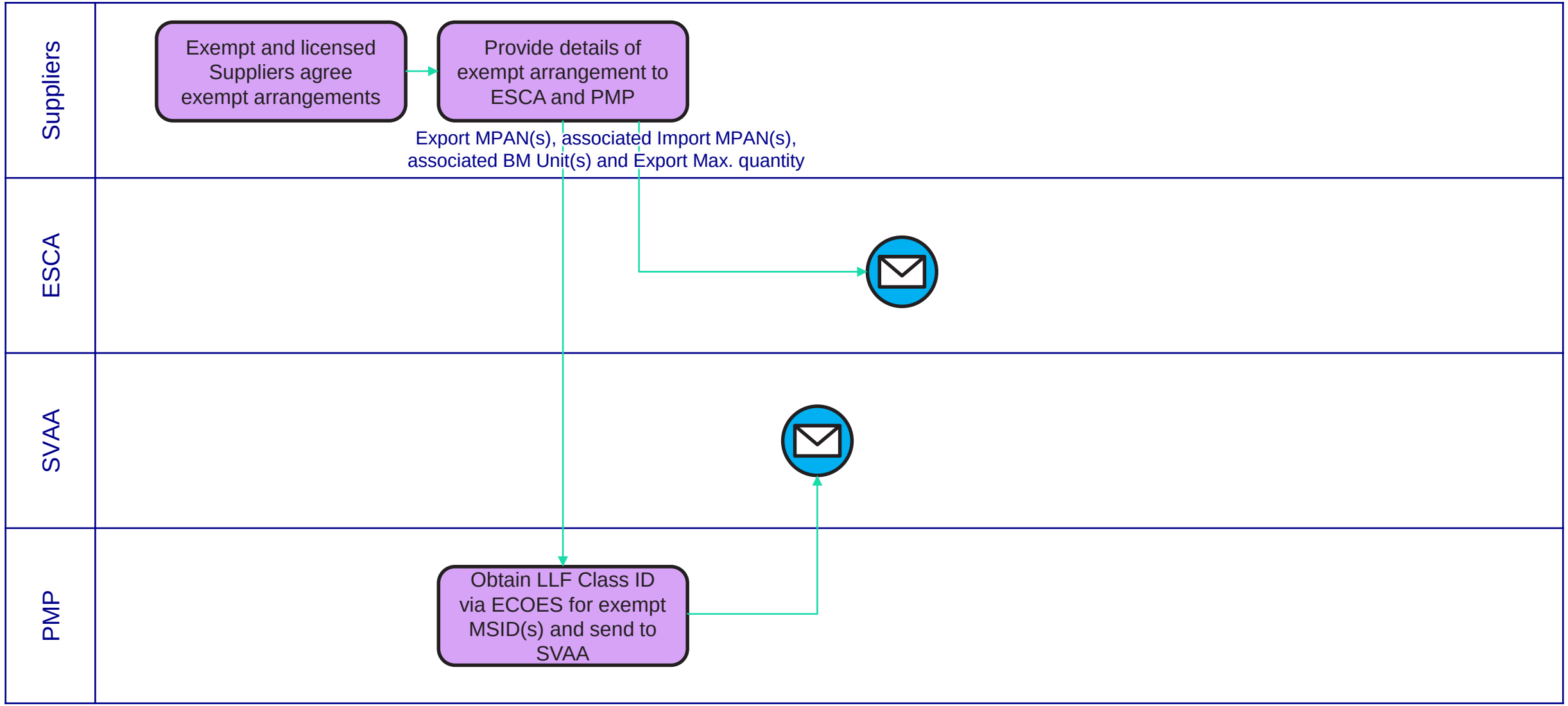
Solution Options for SVA – 1, SVAA applies LLFs: Initial Set-up



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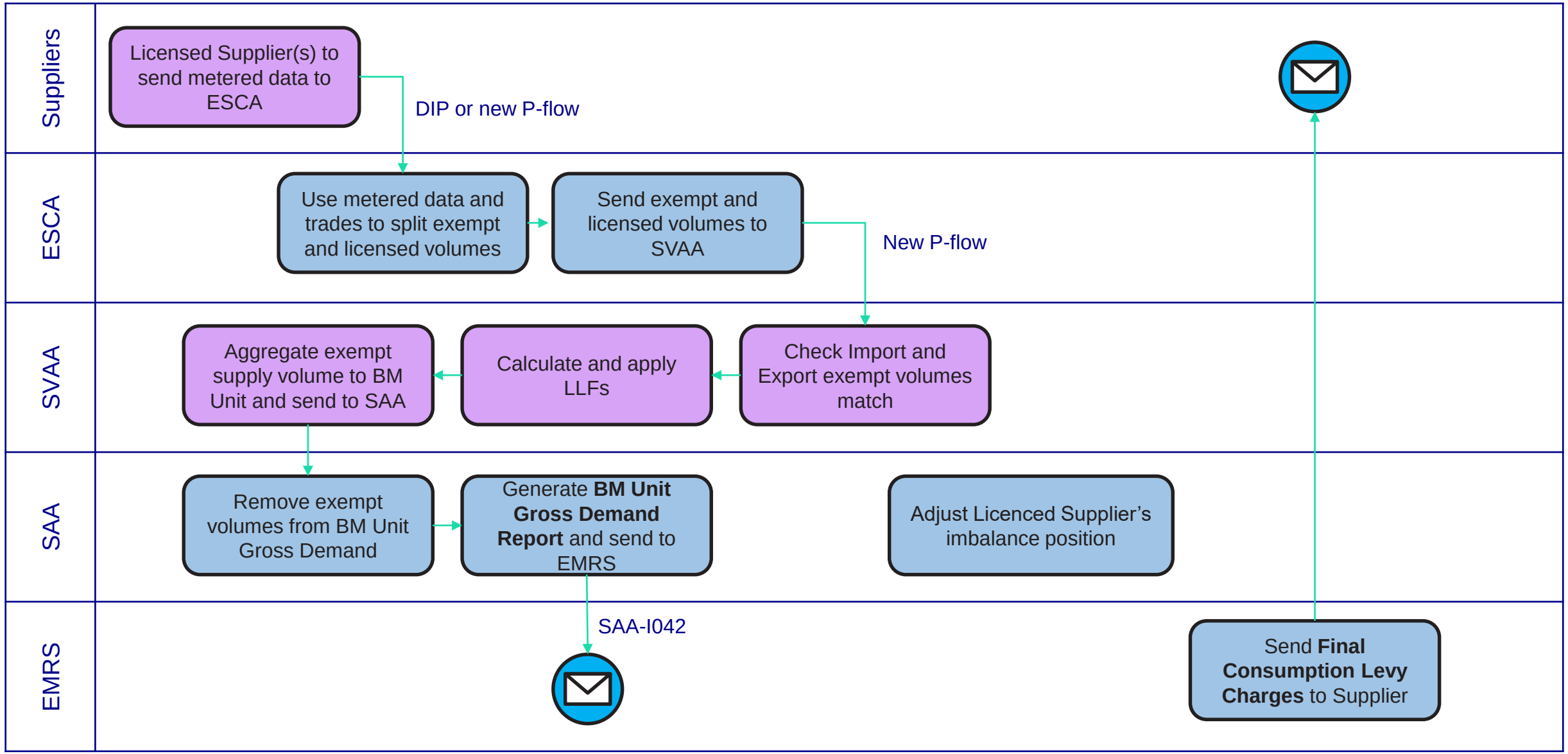
Solution Options for SVA – 1, SVAA applies LLFs



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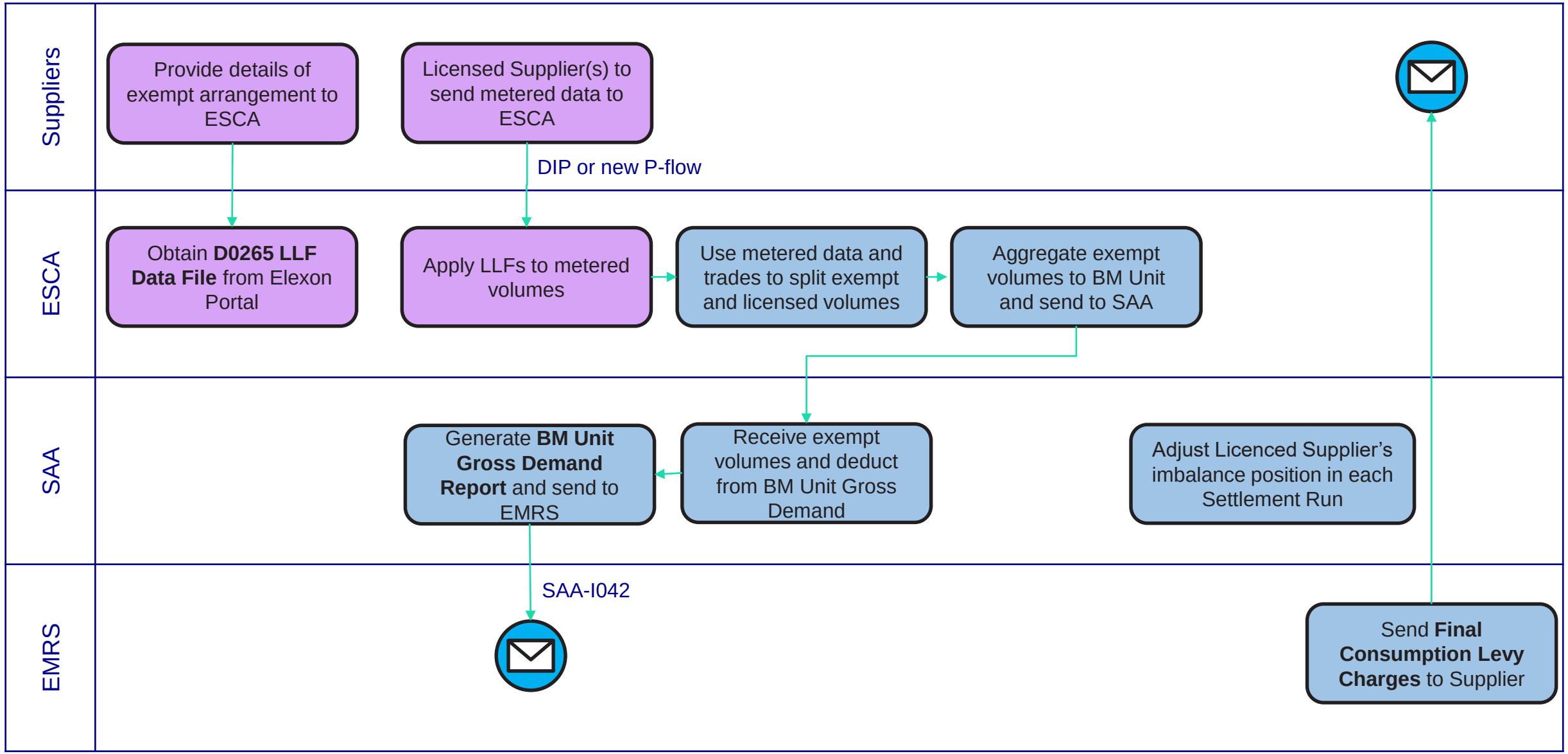
Solution Options for SVA – 2, ESCA applies LLFs for SVA



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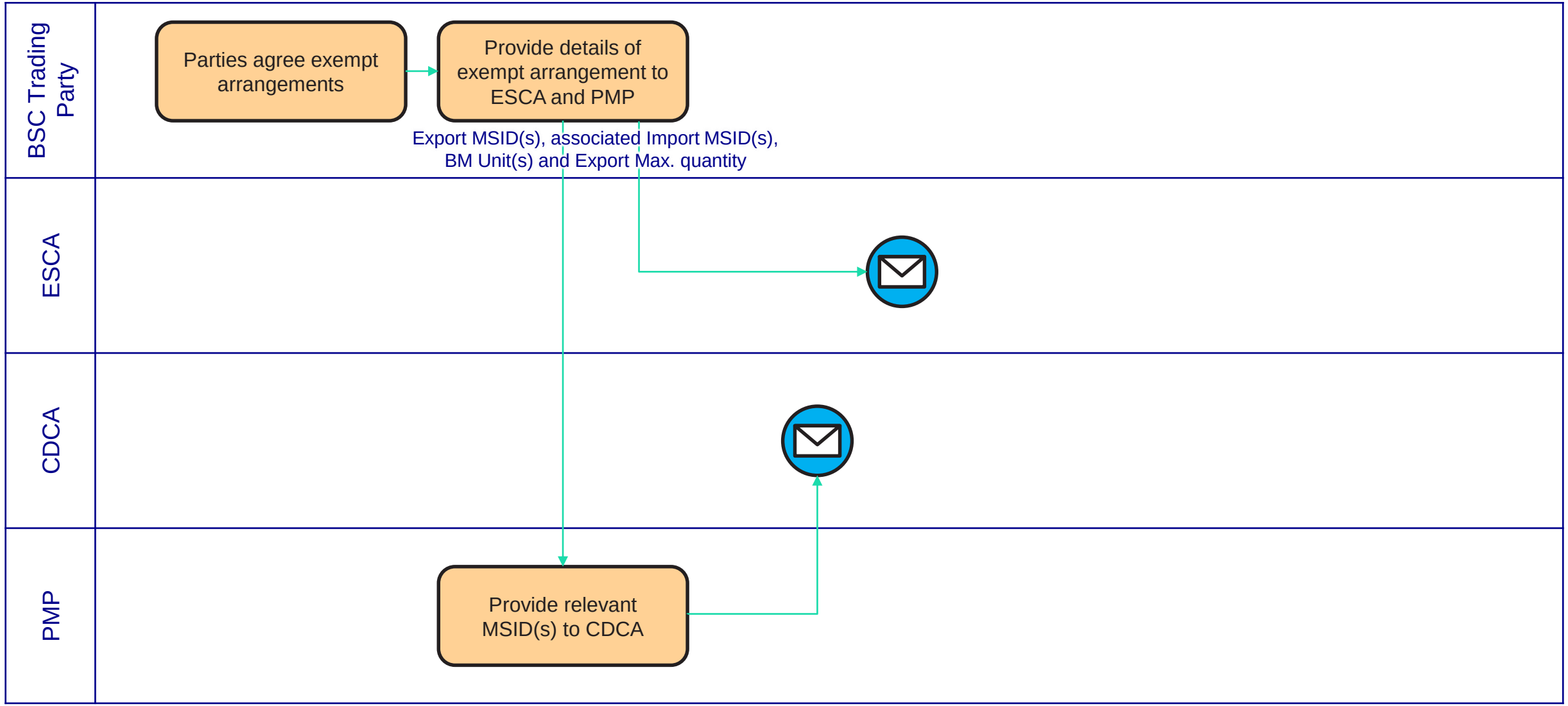
Solution Options for CVA – 1, CDCA applies LLFs: Initial Set-up



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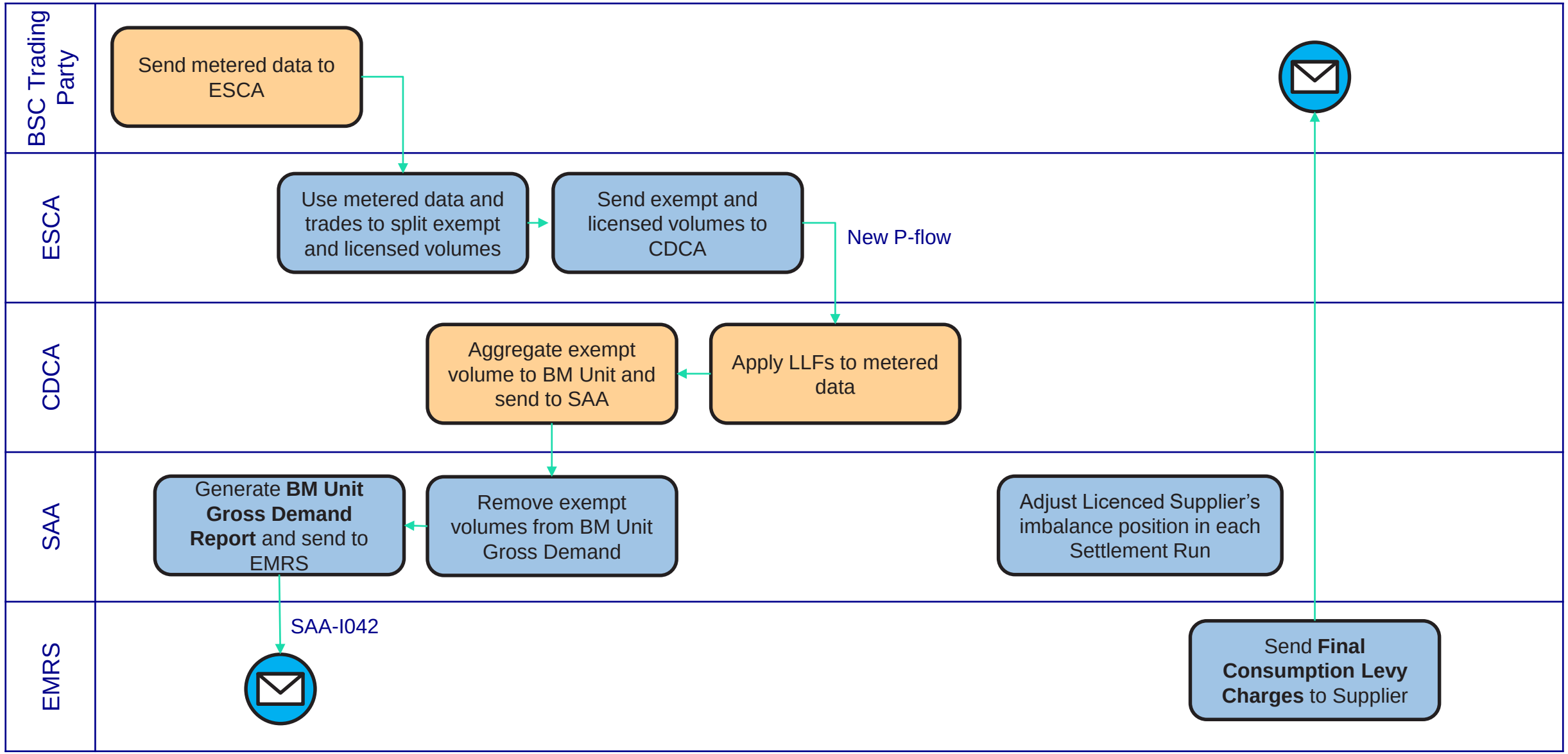
Solution Options for CVA – 1, CDCA applies LLFs



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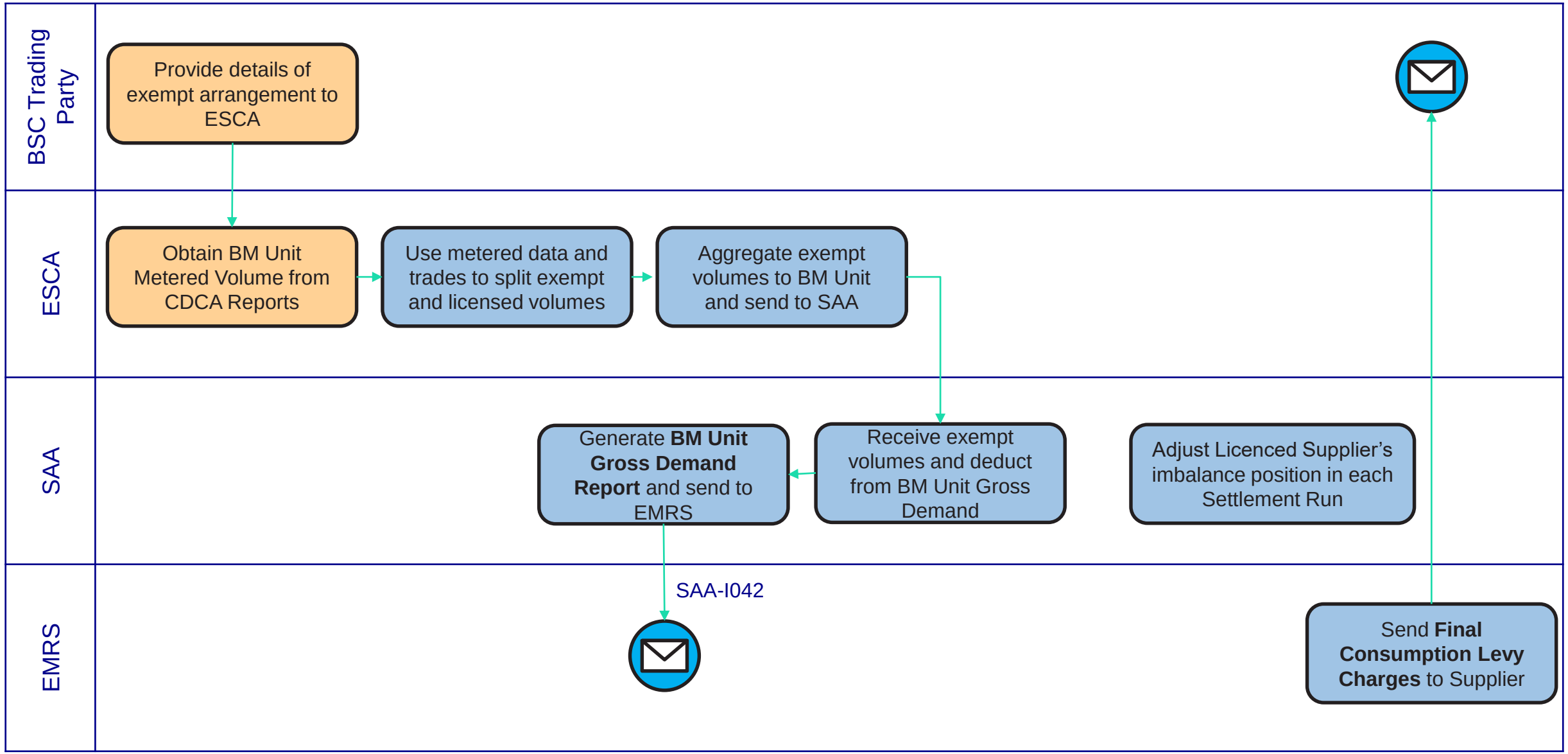
Solution Options for CVA – 2, ESCA applies LLFs for CVA



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Solution Options – Comparison

Solution Options	Pros	Cons
SVA only	• Implementation may be easier	• Limits the applicability of the solution
SVA and CVA	• Includes CVA customers and generators in solution	• Implementation may be more resource intensive
LLFs applied by SVAA/CDCA	• Established processes, consistent with other Modifications • Fewer requirements on the ESCA	• Changes required to BSC systems • Implementation will be more complicated • Allocation done before LLFs applied
LLFs applied by ESCA	• Fewer changes required to BSC systems • Allocation done on volumes with LLFs applied	• Increased qualification requirements for ESCA

- Are there any other pros and cons we should note?

Discussion Points

- Should P442 solution be for SVA only, or for SVA and CVA?
- Should P442 solution have the SVAA/CDCA applying LLFs or the ESCA applying LLFs?

Solution Options – Data

- Data could be sent via:
  - Data Transfer Network (DTN)
  - Data Integration Platform (DIP)
  - Other agreed method e.g. a new P-flow

- For example, data sent by Supplier or HHDC to ESCA could be via:
  - DTN - D0036 or D0275 (these messages are due to be retired during MHHS implementation)
  - DIP - IF-021 ‘UTC Settlement Period Consumption Data’
  - A new P-flow

- DIP will be available post MHHS implementation, estimated 2025, with some DTN messages retired and replaced by DIP messages

- It is estimated that DIP will be cheaper to accede to than the DTN

- Propose that DIP and/or structured P-flows are used:
  - WG could agree list of data items for ESCA P-flows during Assessment Procedure
  - P-flows would be designed during Implementation Stage

Solution Options – Public Data

- The Panel suggested that the WG consider what data will be made publicly available
- Reporting may need to be mindful of confidentiality and protecting commercial arrangements
- Propose that exempt supply volumes are published by GSP group
  - Half-Hourly, or
  - By day

NEW ROLE OPTIONS

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New Role Options

- Some WG members were concerned about difficulties managing Supplier Agent behaviour, and questioned whether ESCA should be a BSC Party

- As a BSC Party, they would have to accede to the BSC, which could provide a more robust compliance and governance framework

- However, being a Party Agent would be more consistent with the Supplier Hub principle and how existing roles are handled:
  - Usually only those trading within the BSC accede to it
  - ESCA role has with similarities to existing Party Agents - ECVNA/MVRNA and parts of the HHDC role

- Party Agents can still be controlled through Performance Assurance, including Qualification

New Role Options – Performance Assurance

- Performance Assurance is applied based on the Settlement Risks posed
  - Will depend on the calculation and solution options agreed upon

- ESCA may be subject to SVA and/or CVA Qualification

- Qualification aims to give assurance that Parties and Party Agents have developed systems and processes to accepted industry standards, are able to fulfil the requirements of the Code, and can communicate with the relevant BSC Agents

- Depending on the solution options agreed, this could include communication with SVAA, CDCA, and SAA

New Role Options – Name

- Currently we have been referring to the role as the Exempt Supply Calculation Agent (ESCA)
- This could cause confusion with Energy Supply Company Administration (ESCA)
- May be benefits to not referring to exempt supply, as the scope of the role could expand
- Potential alternatives:
  - Exempt Supply Reporting Agent (ESRA)
  - Exempt Supply Allocation Agent (ESAA)
- Any other thoughts on appropriate names for the role?

CONSUMER IMPACTS

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Consumer Impacts

Consumer benefit area	Identified impact	Proposer's Rationale
1) Improved safety and reliability	Positive	Being able to offset consumers' electricity needs with micro- to small-scale generators developed by the consumers themselves will improve safety of supply and security of electricity bills compared to the current retail market.
2) Lower bills than would otherwise be the case	Positive	The reduction of social and green levies on consumers' bills will result in true green electricity bills that are affordable for all. The maximum benefit will be realised at the local energy system where local distributed generators are matched with local consumers, reducing network losses and optimising balancing and operating the grid.
3) Reduced environmental damage	Positive	P442 is a step in the journey toward net-zero targets, by enabling small-scale generators to contribute to consumers' green electricity bills, and by enabling electrified heating systems to provide energy to consumer. It will stimulate a micro finance environment for distributed electricity generators such as electric vehicles and CHP. It will also support those who wish to install distributed generation assets where they are unable to install them behind their import meters. Increased distributed energy resources mean lower greenhouse gases from energy consumption.
4) Improved quality of service	Positive	More end consumers will be able to benefit from distributed generation assets for their own consumption needs. This will have a significant impact on the affordability of green electricity bills for all end consumers.
5) Benefits for society as a whole	Positive	Distributed energy resources impact the creation of local energy systems and peer-to-peer markets, which have been shown to have significant impacts on local prosperity. For instance, Oldham Council's Green New Deal Strategy 2020-25 shows a flow of £500million a year outside of the Borough, while a local peer-to-peer market between local generators and consumers will redirect a significant portion of this flow inward. In another feasibility study for a county council in Wales, the local peer-to-peer market would create 1,500-2,000 jobs in five years.

NEXT STEPS

ELEXON

Assessment Procedure progression plan

Event	Date
Workgroup meeting 2	24 May 2023
Elexon to prepare Business Requirements, and redlining for Legal Text and BSCPs	June and July 2023
WG review of redlining	**W/C 24 July 2023**
Workgroup meeting 3	W/C 31 July 2023
Elexon finalising Assessment Procedure Consultation	W/C 14 August 2023
WG review of Assessment Procedure Consultation	**W/C 21 August 2023**
Assessment Procedure Consultation	29 August – 15 September 2023
WG meeting 4	W/C 2 October 2023
WG review of Assessment Report	**W/C 16 October 2023**
Present AR to Panel	9 November 2023

MEETING CLOSE

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THANK YOU

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25 May 2023