

# VGI Use-Case Scoring

California Interagency VGI Working Group

**Dr. Karim Farhat**

Feb 7, 2020



# Objectives

## 01 Group scoring

Analyze and understand the parties' collective scoring of benefits, costs and implementability for VGI use-cases

## 02 “Value now” thresholds

Develop specific scoring thresholds, as agreed-upon criteria to help define a list of favorable use-cases for PUC Question A

## 03 Individual scoring

Compare and consider reconciling Individual scoring with Group scoring, to help answer PUC Question A

## 04 Recommendations

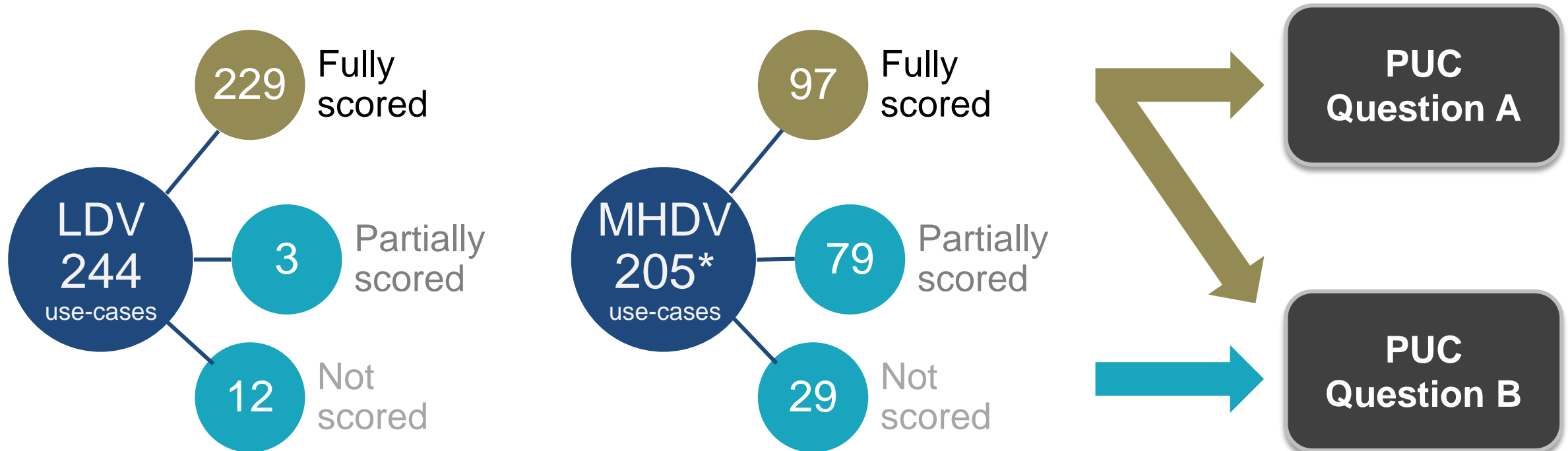
Recommended answers to PUC Question A



# Executive Summary

- Scoring data may be used to address both PUC questions A and B.
- It's important to account for all three scoring metrics (benefit, cost, and implementability) to answer PUC Question A. Benefits and costs help inform the “*can provide value*” aspect, while costs and implementability help inform the “*now*” aspect. We propose two “value now” thresholds for that purpose: **PRIME-Strict** & **PRIME-Flex**.
  - **PRIME-Strict**: The use-case is considered favorable if the average of all parties' scoring deemed it so
  - **PRIME-Flex**: The use-case is considered favorable if at least one party scoring deemed it so
- Not every use-case that got fully scored should be deemed “favorable”. Some parties scored use-cases to explicitly show they are “unfavorable”.
- Scoring of LDV use-cases shows clear trends, where some are favorable across all metrics and others are unfavorable across all metrics. The majority of scored MHDV use-cases are deemed favorable.
- **Recommended answer to PUC Question A – Part 1: What use-cases can provide value now?**
  - LDV: All use-cases that pass the **PRIME-Flex** threshold; total of 91 use-cases
  - MHDV: All use-cases that pass the **PRIME-Flex** threshold; total of 43 use-cases
  - Additional use-cases for special considerations
    - LDV: Residential SFH, MUD, & Workplace / V2G / Customer & System Backup Resiliency
    - MHDV: School Bus / V1G and V2G / Customer Bill Management, System RA, Day-Ahead Energy
- **Recommended Answer to PUC Question A – Part 2: How to capture this value?**
  - Capturing the value must consider, and is already engraved in, the very definition of the use-case, specifically in dimensions 4 “Approach” and dimension 5 “Resource Alignment”

# Scoring data may be used to address PUC questions A and B



*\* NOTE: For MHDV, the number of use-cases accounts for several technology variations of the same use-case. Without distinguishing technology variations, the number of unique use-cases is 109.*

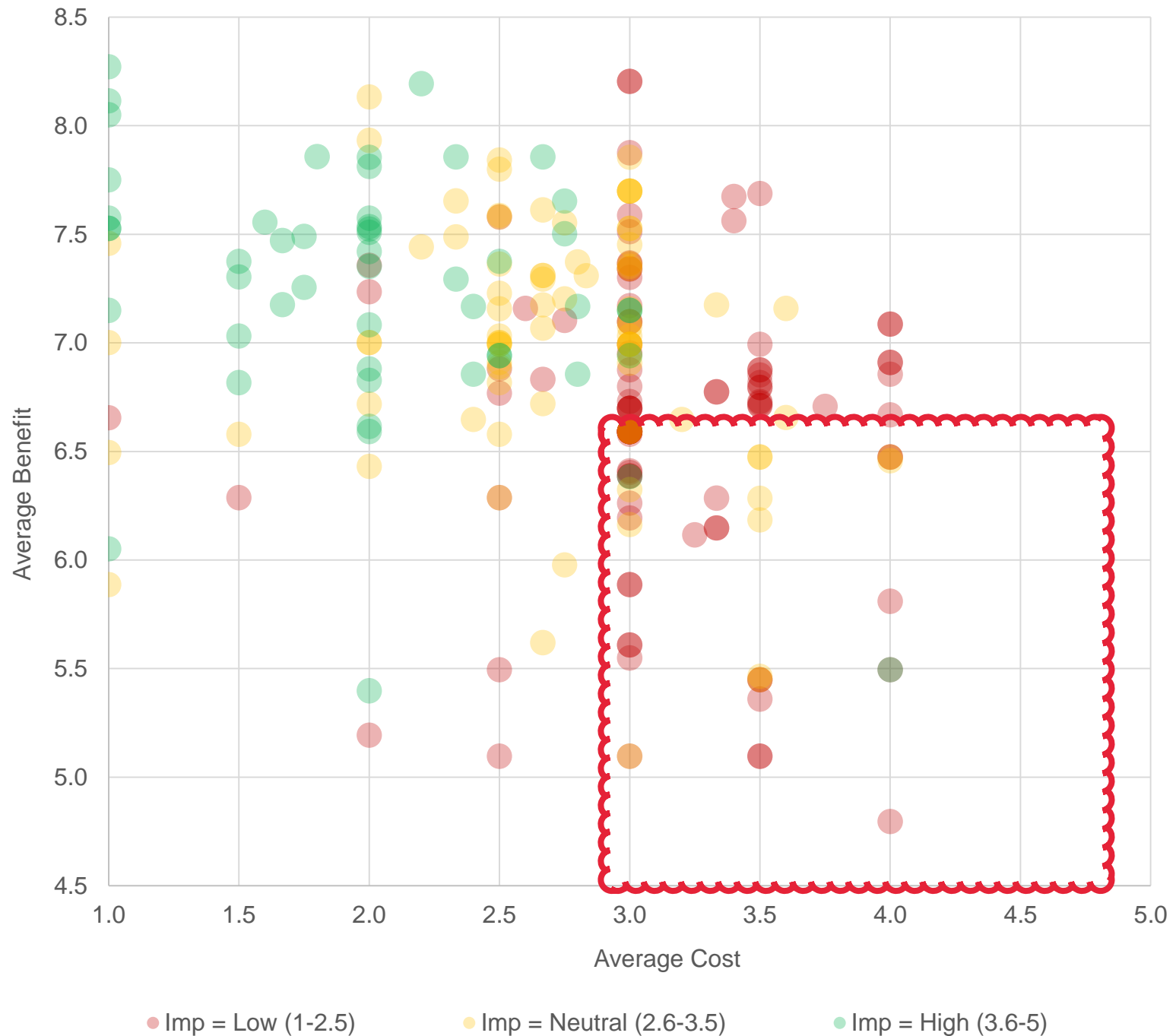
A hand is shown holding a glowing, spherical network structure composed of interconnected nodes and lines. The background is a blurred image of a laptop keyboard. The overall color scheme is dark blue and teal.

# LDV Use-cases

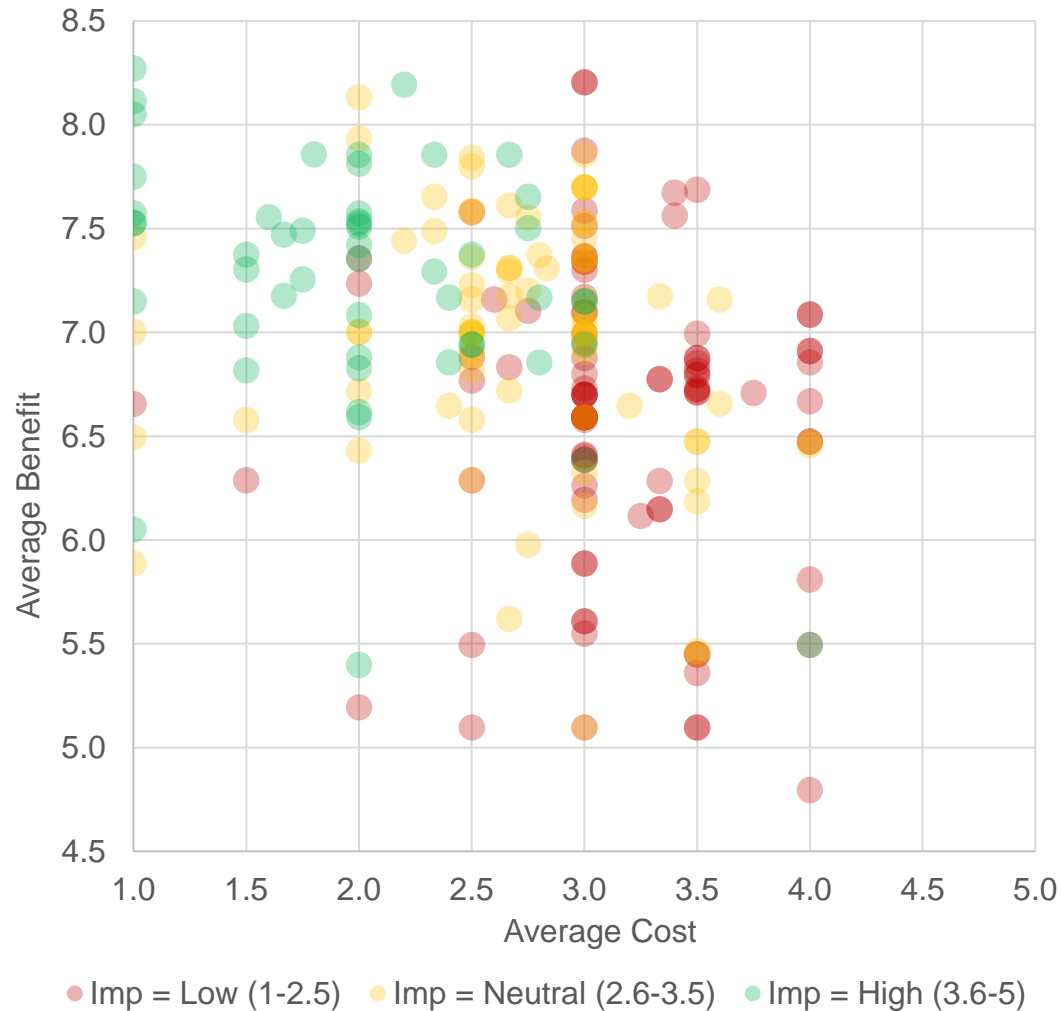


# Group average scores show healthy scatter across VGI use-cases

- Every “bubble” represents a fully scored use-case; total of 229
- **Benefit** score: vertical axis
- **Cost** score: horizontal axis
- **Implementability** score: color of the bubble, falling into 1 of 3 categories
  - **Red** = Low implementability, score [1-2.5]
  - **Yellow** = Neutral implementability, score [2.5-3.5]
  - **Green** = High implementability, score [3.6-5]



# Data Insights



## 1. Clear trends: Some use-cases are favorable across all metrics, and some are unfavorable across all metrics

- Favorable: Use-cases with high benefits and low costs also tend to have high implementability scores
- Unfavorable: Use-cases with low benefits and high costs also tend to have low implementability scores

## 2. Not every use-case that got scored is “favorable”. Some parties scored use-cases to explicitly show they are “unfavorable”

## 3. Less precision, confidence, and/or certainty in cost estimates compared to benefit estimates

- High concentration of use-cases with average cost score = 3

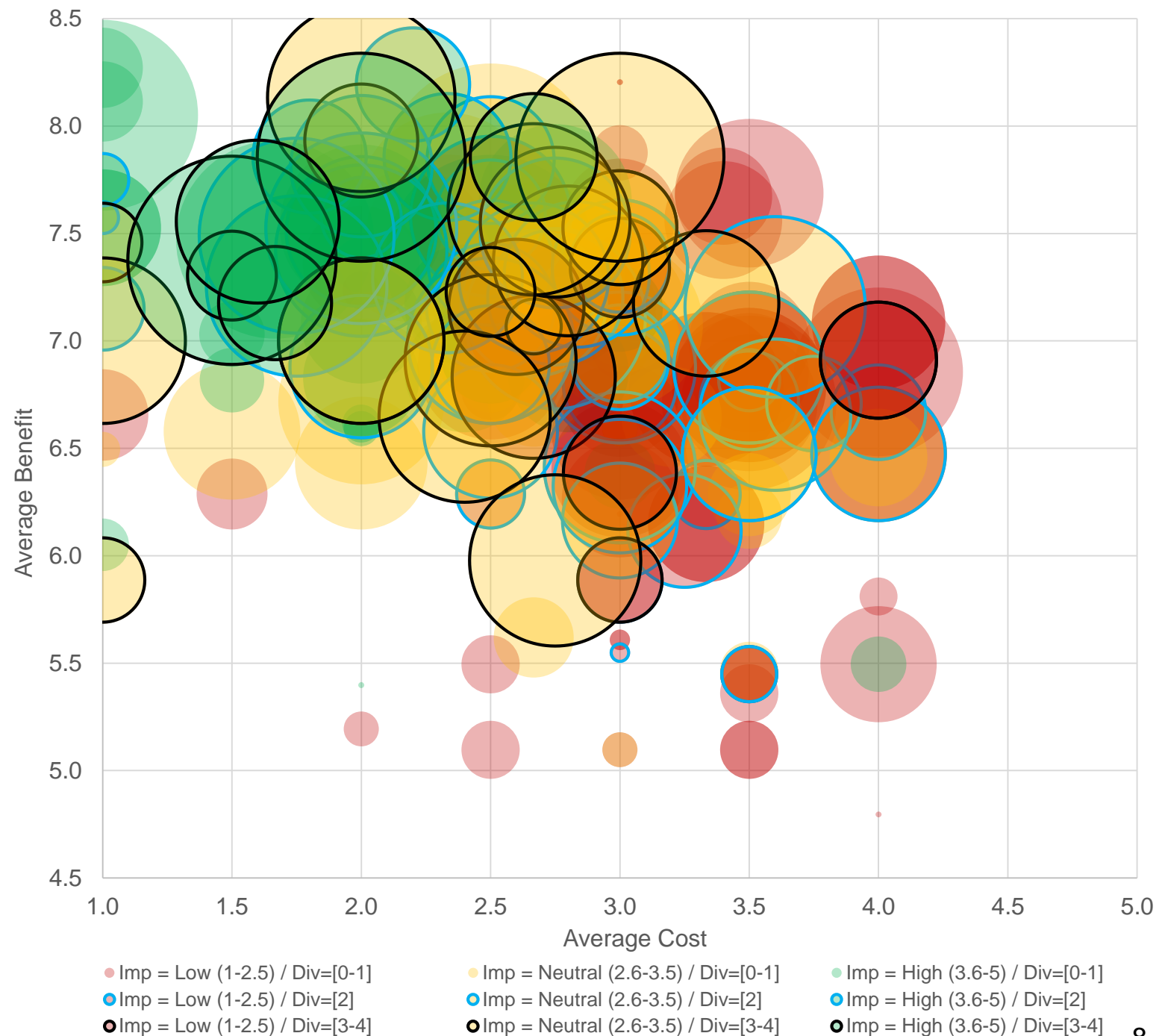
# Non-trivial divergence in the parties' individual scores across VGI use-cases

## Divergence in benefit/cost scoring

- **The size of bubble is** indicative of the min-max range in benefit/cost scoring
  - The larger the bubble, the larger the divergence in scores that the parties assigned to benefit/cost

## Divergence in implementability

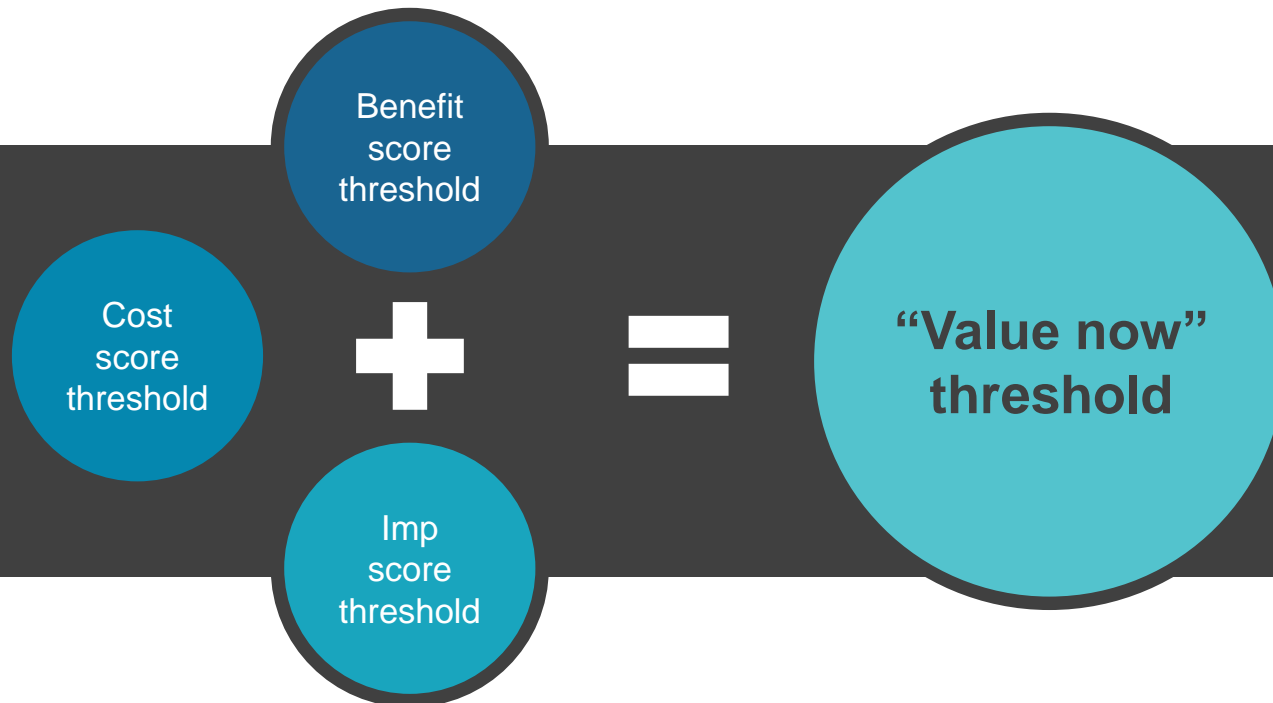
- **The color of the bubble border is** indicative of the min-max range in implementability scoring
  - No border = divergence [0-1]
  - Blue border = divergence [2]
  - Black border = divergence [3-4]





# “Value now” thresholds

- PUC Question 1 requires identifying what use-cases “*can provide value now*”
  - *can provide value* → Focus on benefits and costs
  - *now* → Focus on cost and implementability
- Define “Value now” threshold, that: (1) combines thresholds across the three scoring metrics ‘benefits’, ‘costs’, and ‘implementability’, and (2) accounts for the divergence in parties’ scores
- Use-cases can then be categorized based on the “value now” threshold



Based on group scoring, what use-cases meet the “value now” threshold, and what use-cases don’t?

# “Value now” thresholds

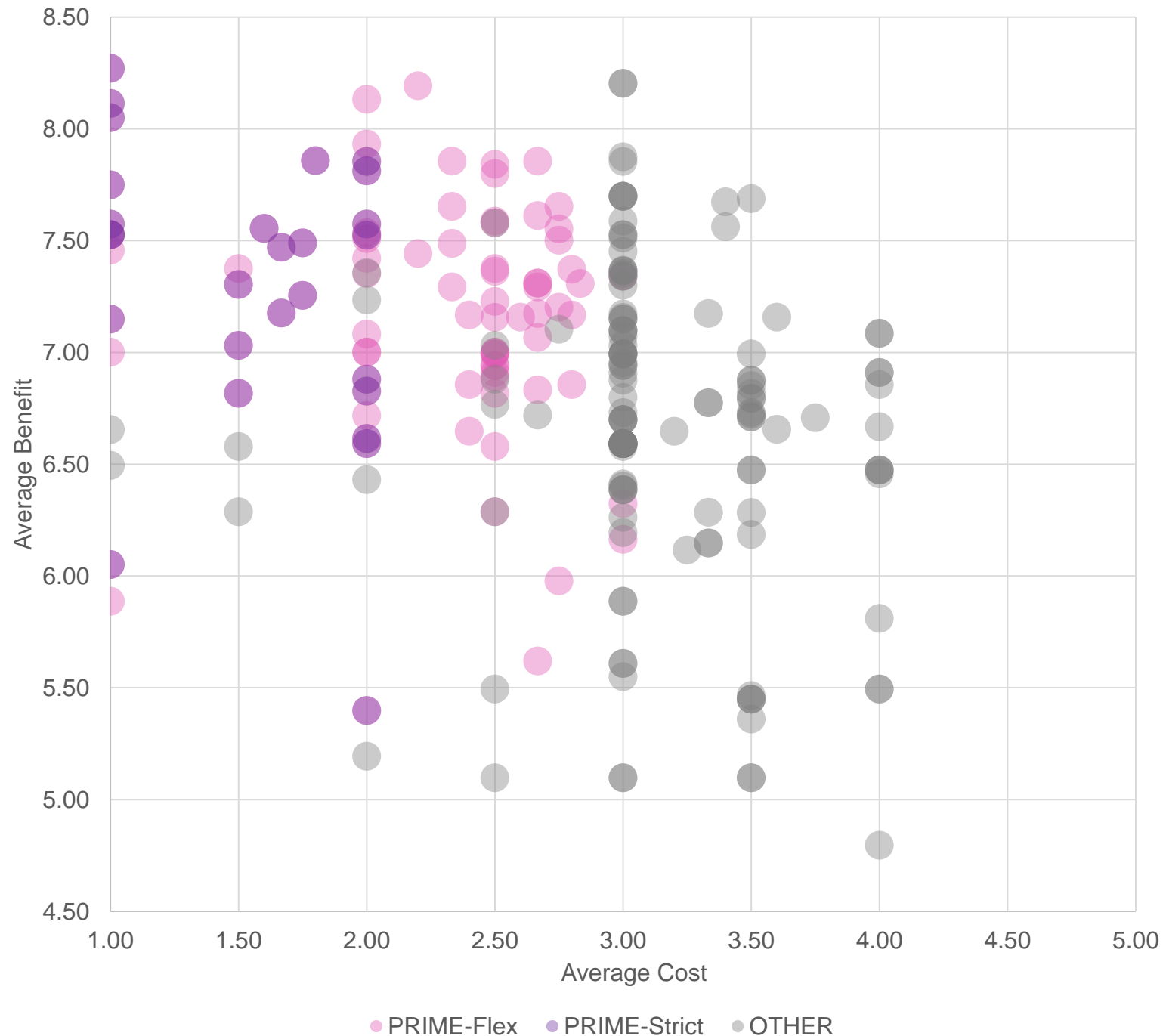
- PUC Question 1 requires identifying what use-cases “**can provide value now**”
  - **can provide value** → Focus on benefits and costs
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- Define “**Value now**” threshold, that: (1) combines thresholds across the three scoring metrics ‘benefits’, ‘costs’, and ‘implementability’, and (2) accounts for the divergence in parties’ scores
- Use-cases can then be categorized based on the “**value now**” threshold

## Alignment with other proposed methods and approaches

- ✓ **SDG&E:** Let’s be inclusive not exclusive
- ✓ **Honda:** Let’s make use of all scoring metrics
- ✓ **Ford & Nissan:** Let’s try to group the use-cases

# “Value now” thresholds can help recognize favorable use-cases on all three scoring metrics

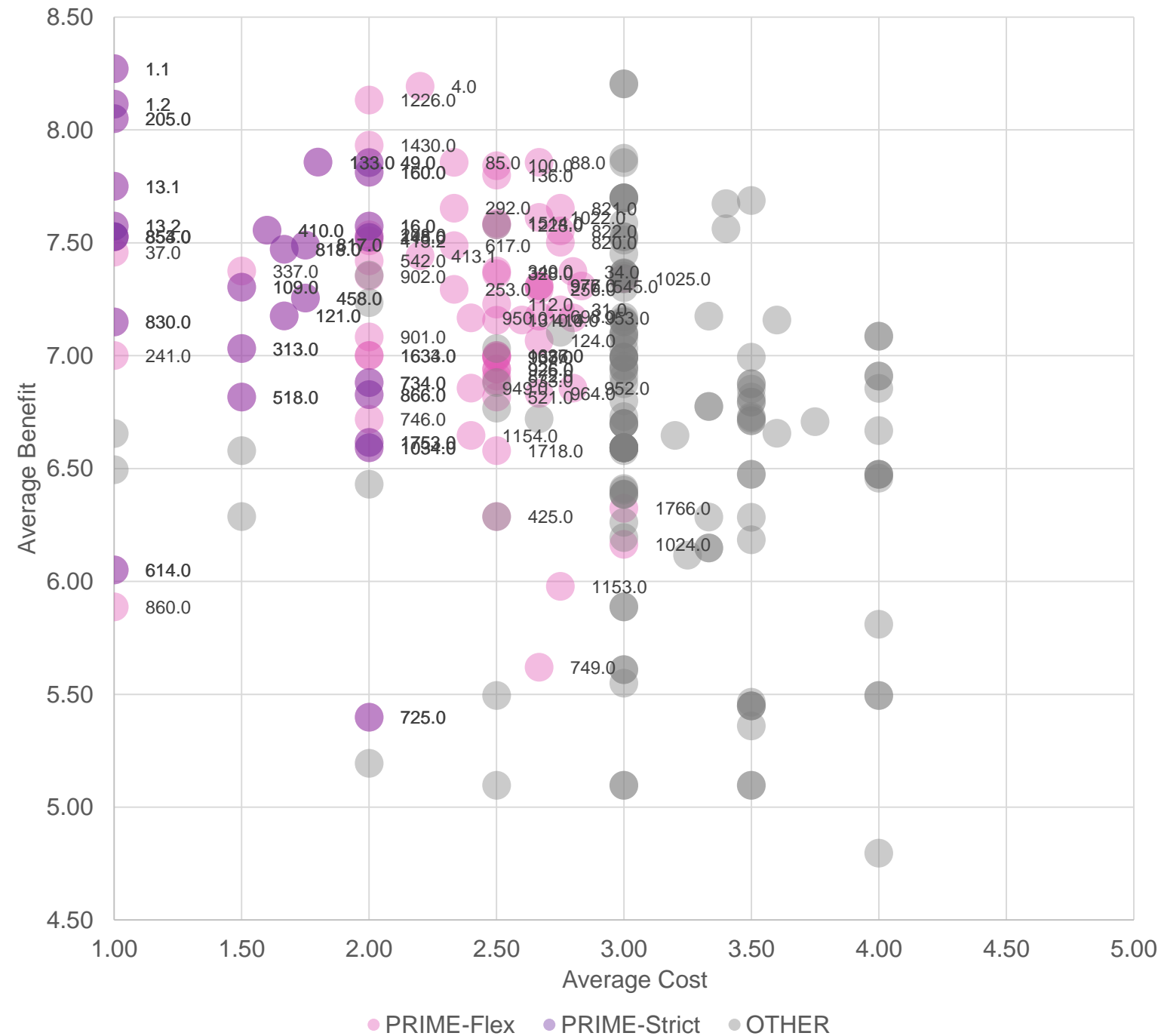
- Two illustrative “value now” thresholds are applied to group scoring results:
- **PRIME-Strict** “value now” threshold: The use-case is considered favorable if the average of parties scoring deemed it so
  - Average Benefit: score  $\geq 5$
  - Average Cost: score  $\leq 2$
  - Average Implementability: score  $\geq 4$
- **PRIME-Flex** “value now” threshold: The use-case is considered favorable if at least one party scoring deemed it so
  - Max Benefit: score  $\geq 5$
  - Min Cost: score  $\leq 2$
  - Max Implementability: score  $\geq 4$



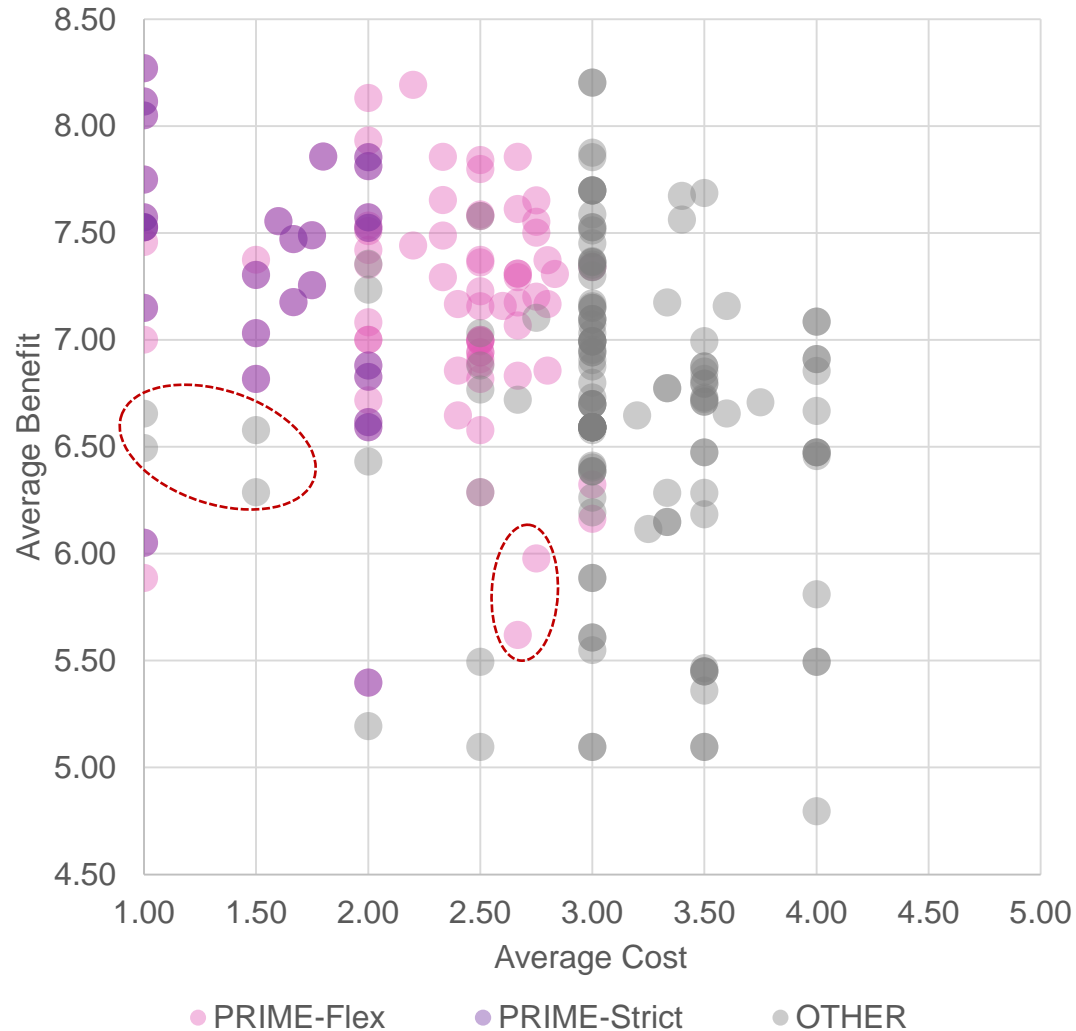


# “Value now” thresholds can help recognize favorable use-cases on all three scoring metrics

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  - Max Benefit: score  $\geq 5$
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  - Max Implementability: score  $\geq 4$



# Data Insights



## 1. “Value now” threshold

- **Benefit  $\geq 5$** : at or greater than hundreds of thousands of dollars
- **Cost  $\leq 2$** : low or very low cost
- **Implementability  $\geq 4$** : easy, or not risky, or both easy and not risky to implement

## 2. PRIME-Strict: 27 use-cases total

- use-case is considered favorable if average of parties scoring deemed it so

## 3. PRIME-Flex: 91 use-cases total

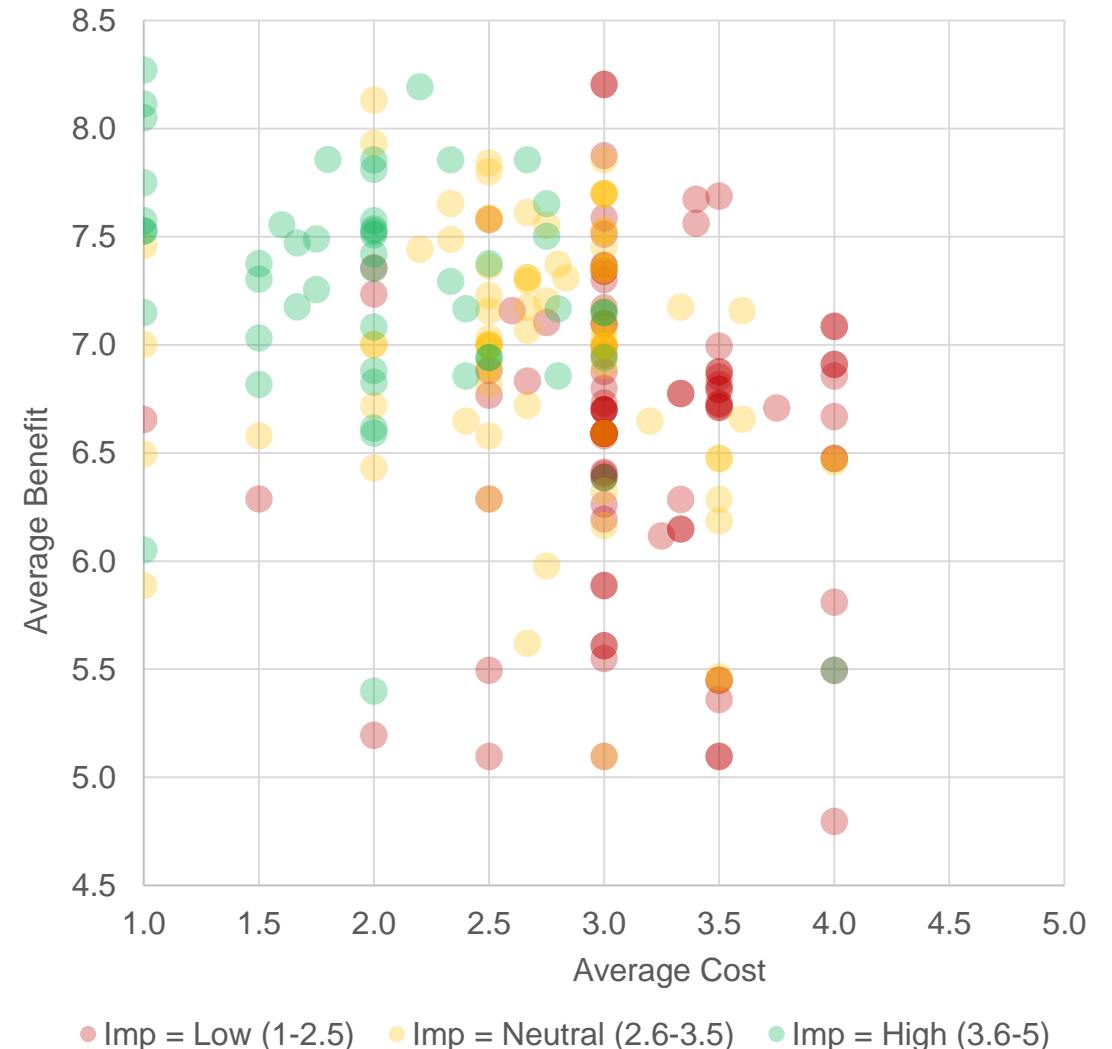
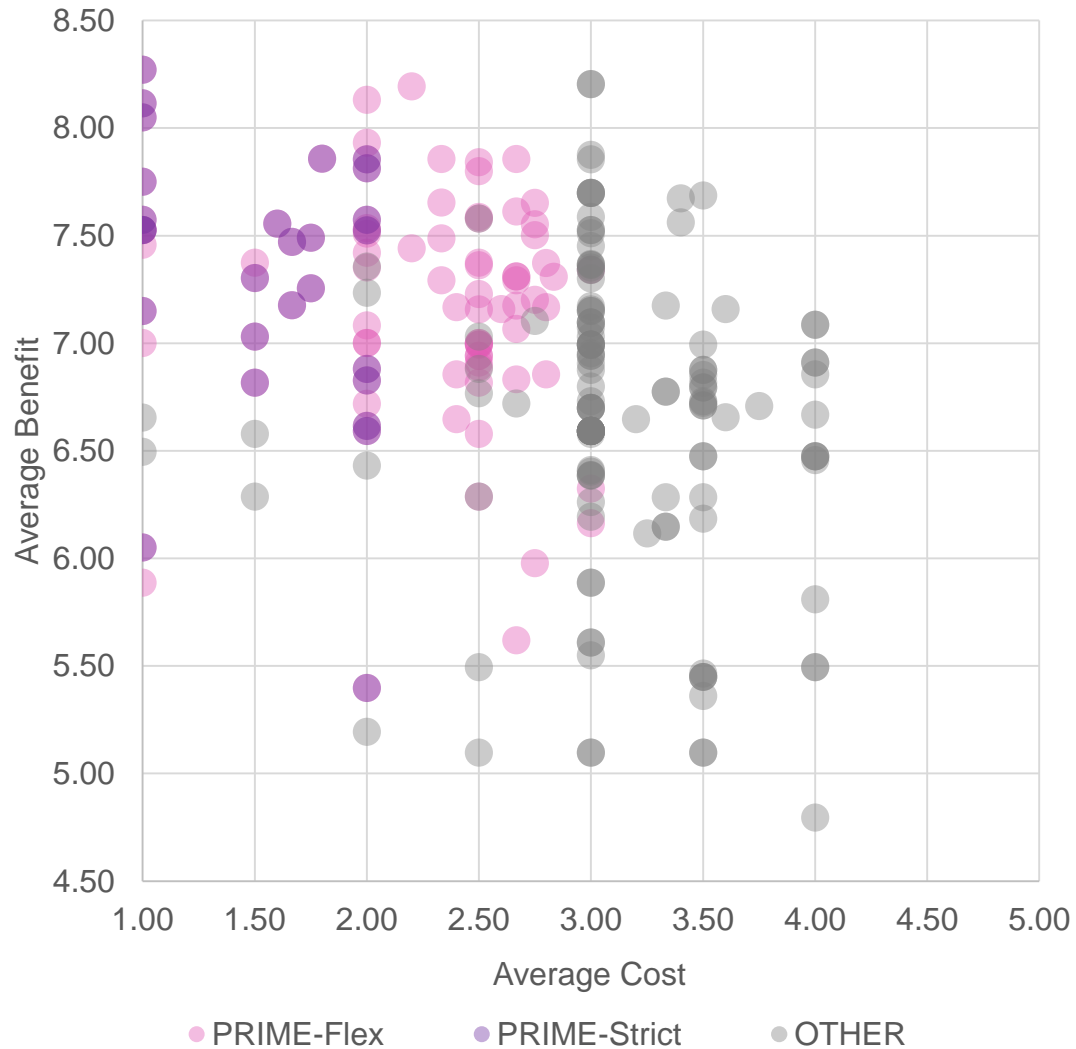
- use-case is considered favorable if at least one party scoring deemed it so

## 4. The “value now” thresholds highlight specific use-cases with conflicting favorability indicators

- Lower cost but lower implementability
- Higher cost but higher implementability

## 5. By design, PRIME-Flex use-cases include all PRIME-Strict use-cases!

# “Value now” thresholds can help synthesize insights from the parties’ scoring of three metrics (benefit, cost, implementability)



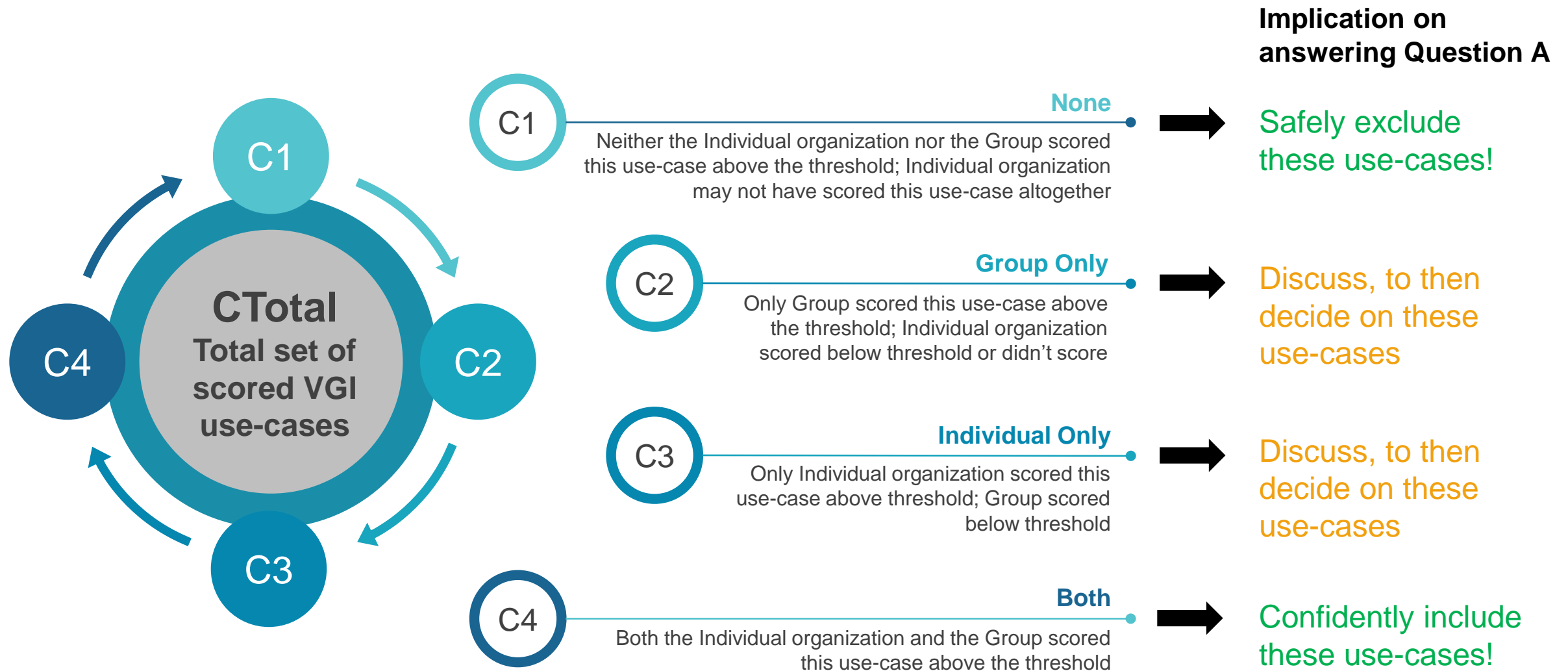


# LDV Use-cases

Group  
assessment

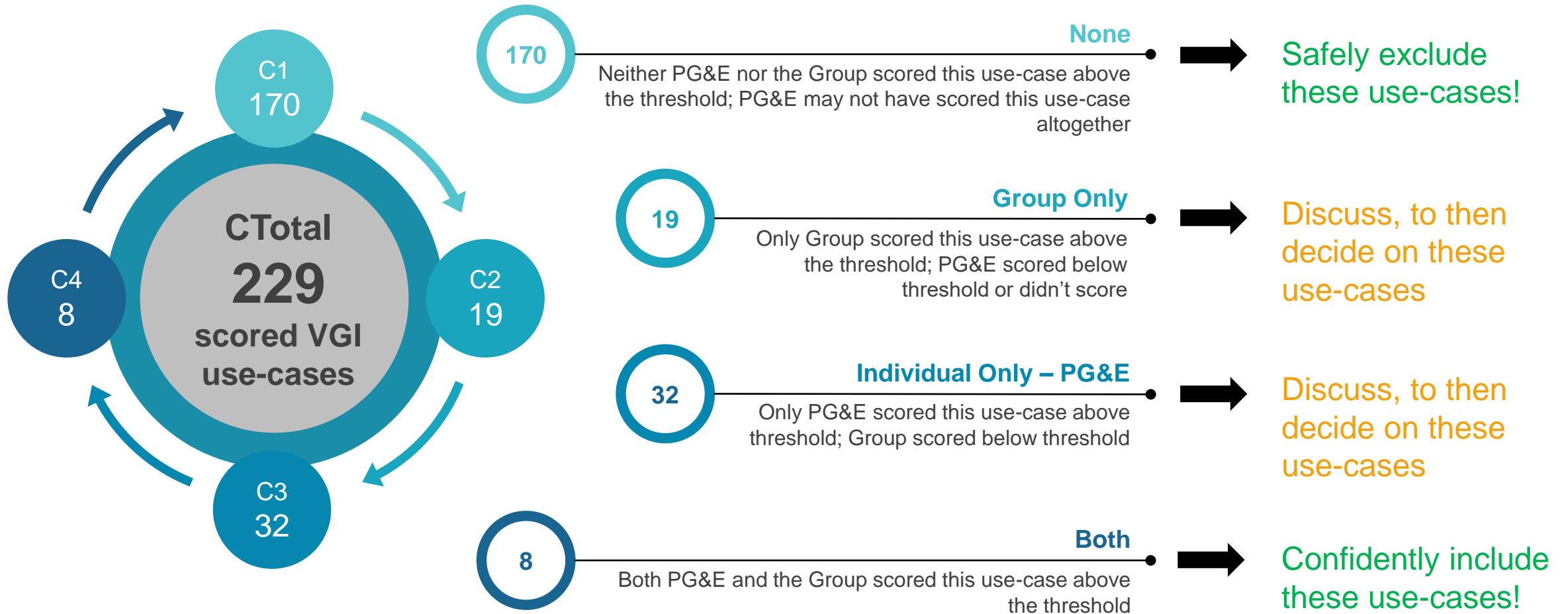
Individual  
assessment

# Applying “value now” thresholds helps compare Group scoring to Individual scoring, resulting in four classes of use-cases



# Illustrative example: Apply the **PRIME-Strict** threshold to compare Group scoring and PG&E scoring

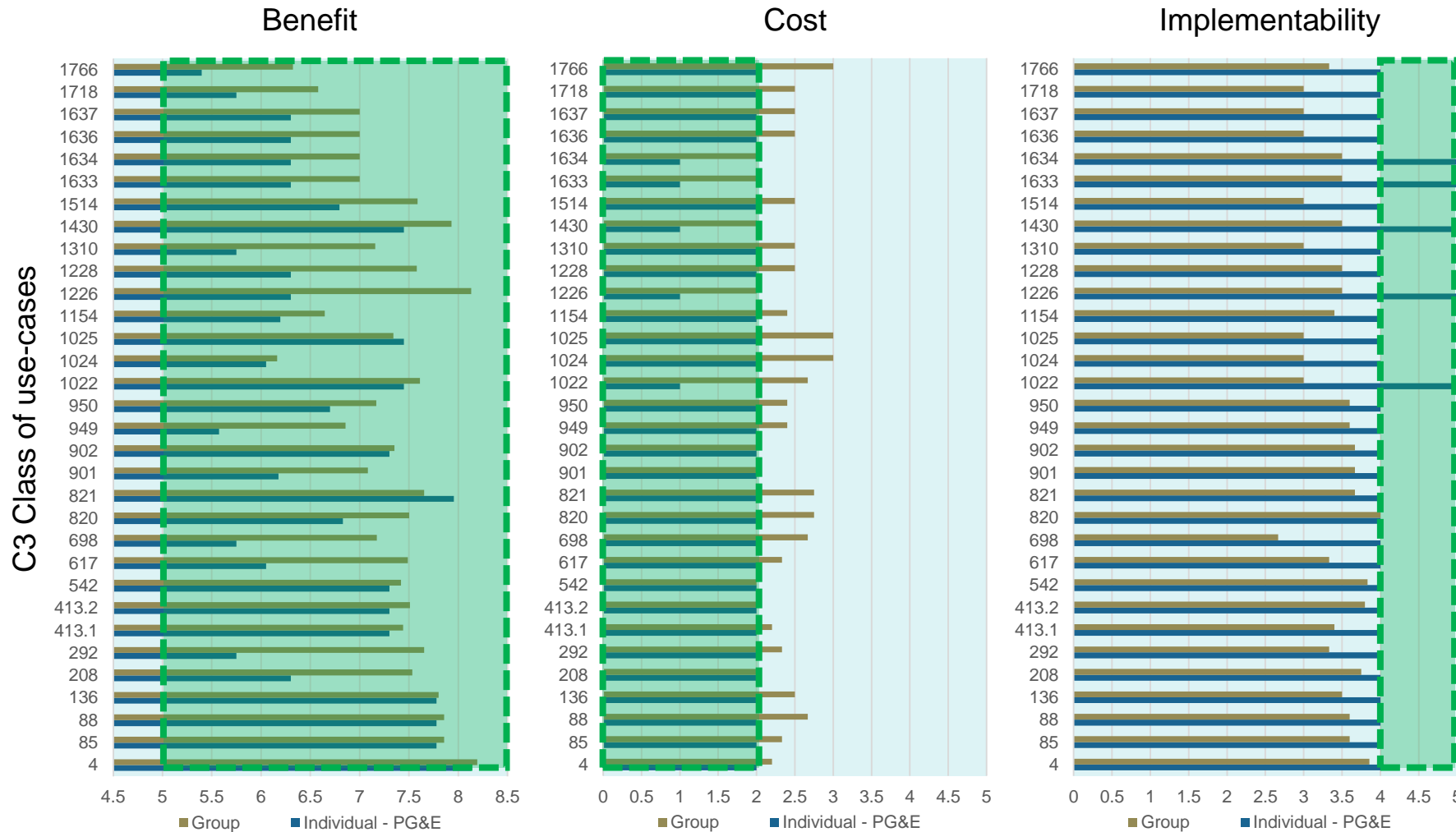
Clarification: The example below uses publicly available information submitted by PG&E to this Interagency VGI Working Group. This example is not intended to convey, directly or indirectly, any views, recommendations, or standing on behalf of PG&E, for or beyond this Working Group. This example is for illustrative purposes only.





# Illustrative example: Apply the **PRIME-Strict** threshold to compare Group scoring and PG&E scoring

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**Benefit threshold:** Despite variations, both PG&E and Group scorings meet the threshold

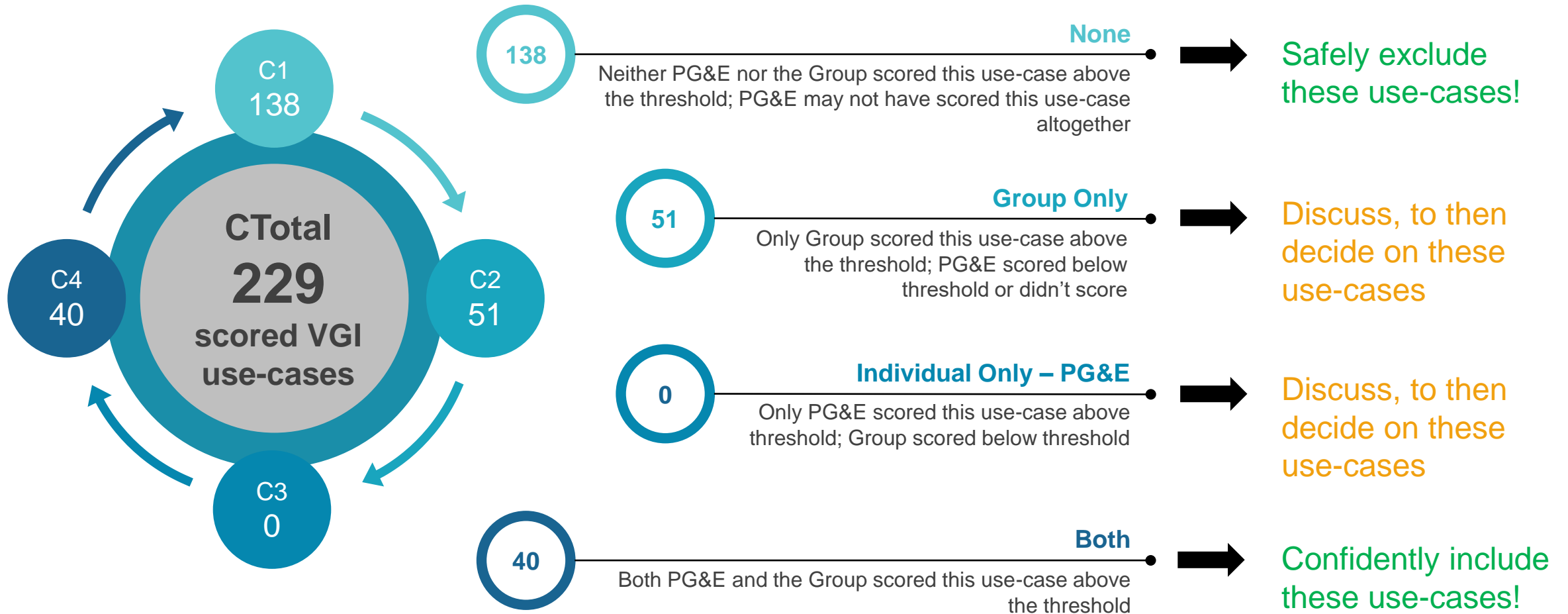
**Cost threshold:** Group scored cost higher than PG&E for several use-cases

**Implementability threshold:** Group scored implementability lower than PG&E for several use-cases

**Discussions needed to consider reconciling those differences**

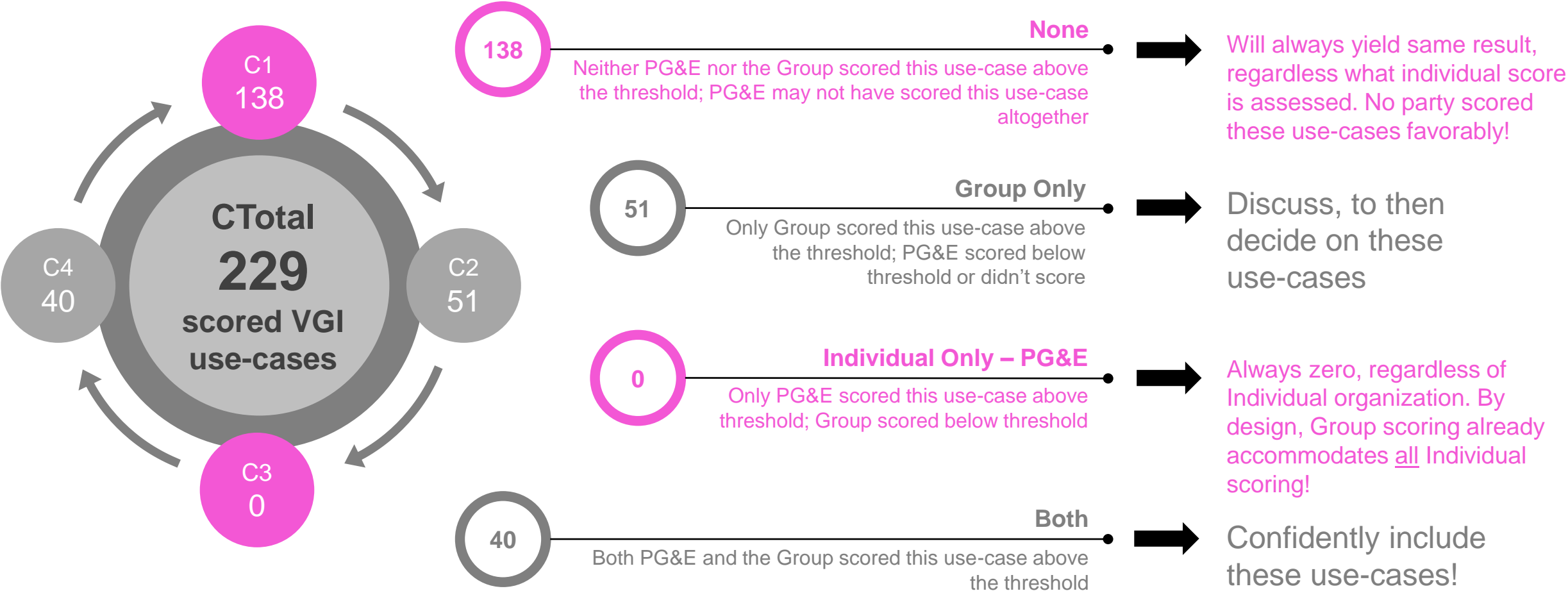
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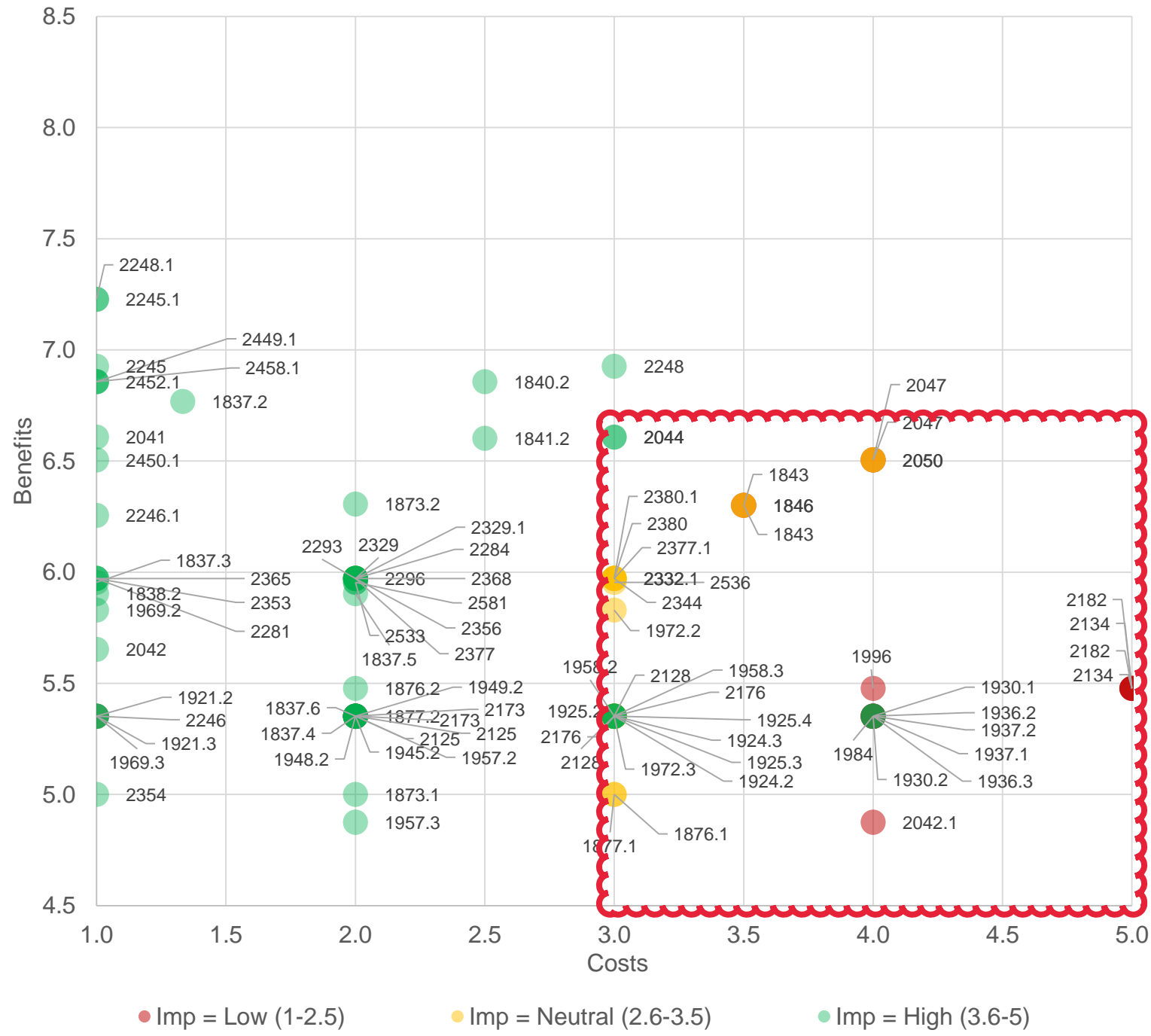
A hand holding a smartphone is the central focus, with a glowing network of nodes and lines overlaid on the screen. The background is a dark blue gradient with a faint grid pattern.

# MHDV Use-cases

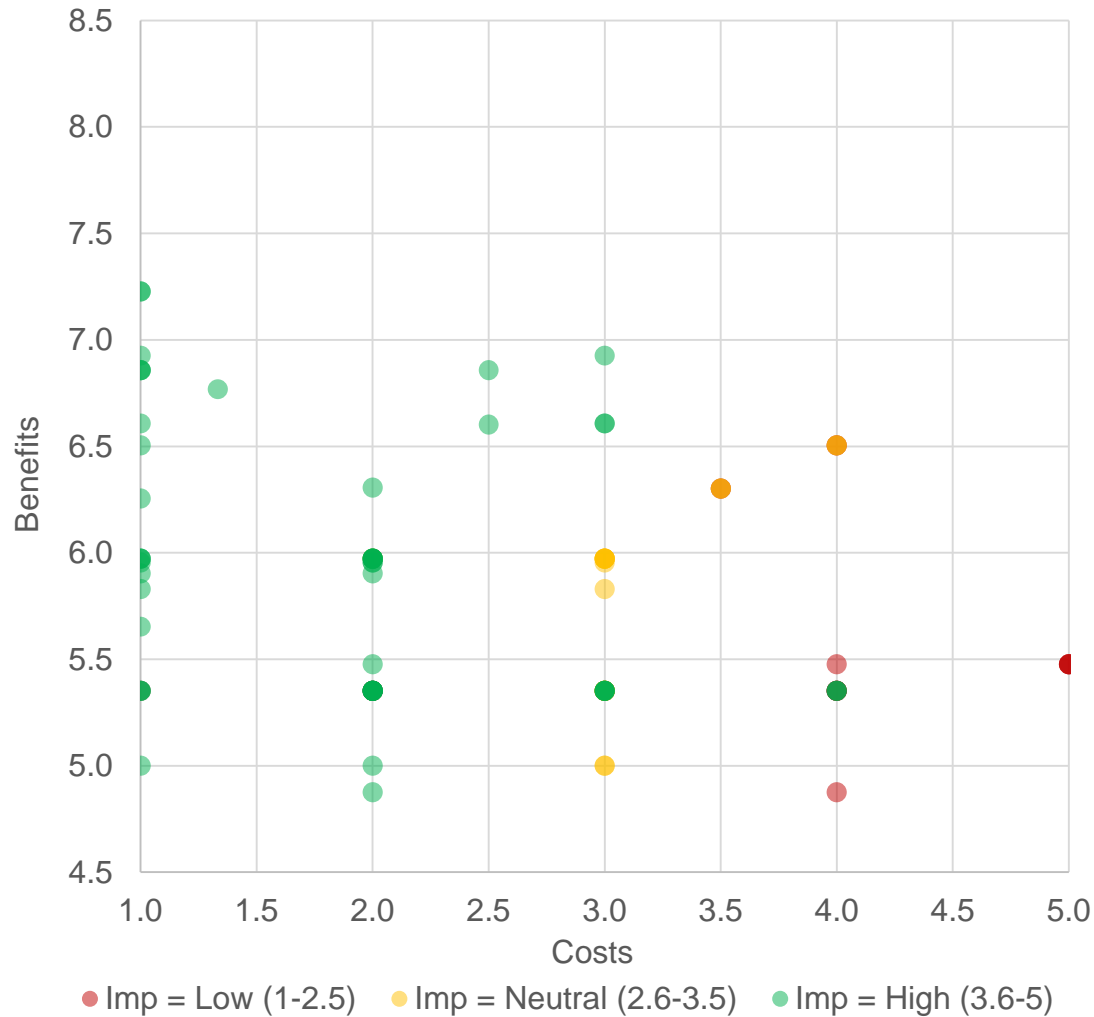


# Group average scores show limited scatter across VGI use-cases

- Every “bubble” represents a fully scored use-case; total of 97
- **Benefit** score: vertical axis
- **Cost** score: horizontal axis
- **Implementability** score: color of the bubble, falling into 1 of 3 categories
  - **Red** = Low implementability, score [1-2.5]
  - **Yellow** = Neutral implementability, score [2.5-3.5]
  - **Green** = High implementability, score [3.6-5]



# Data Insights



1. The majority of the fully scored MHDV use-cases seem to be favorable, with higher implementability and lower cost

2. Limited divergence among parties' scores, due to two reasons:

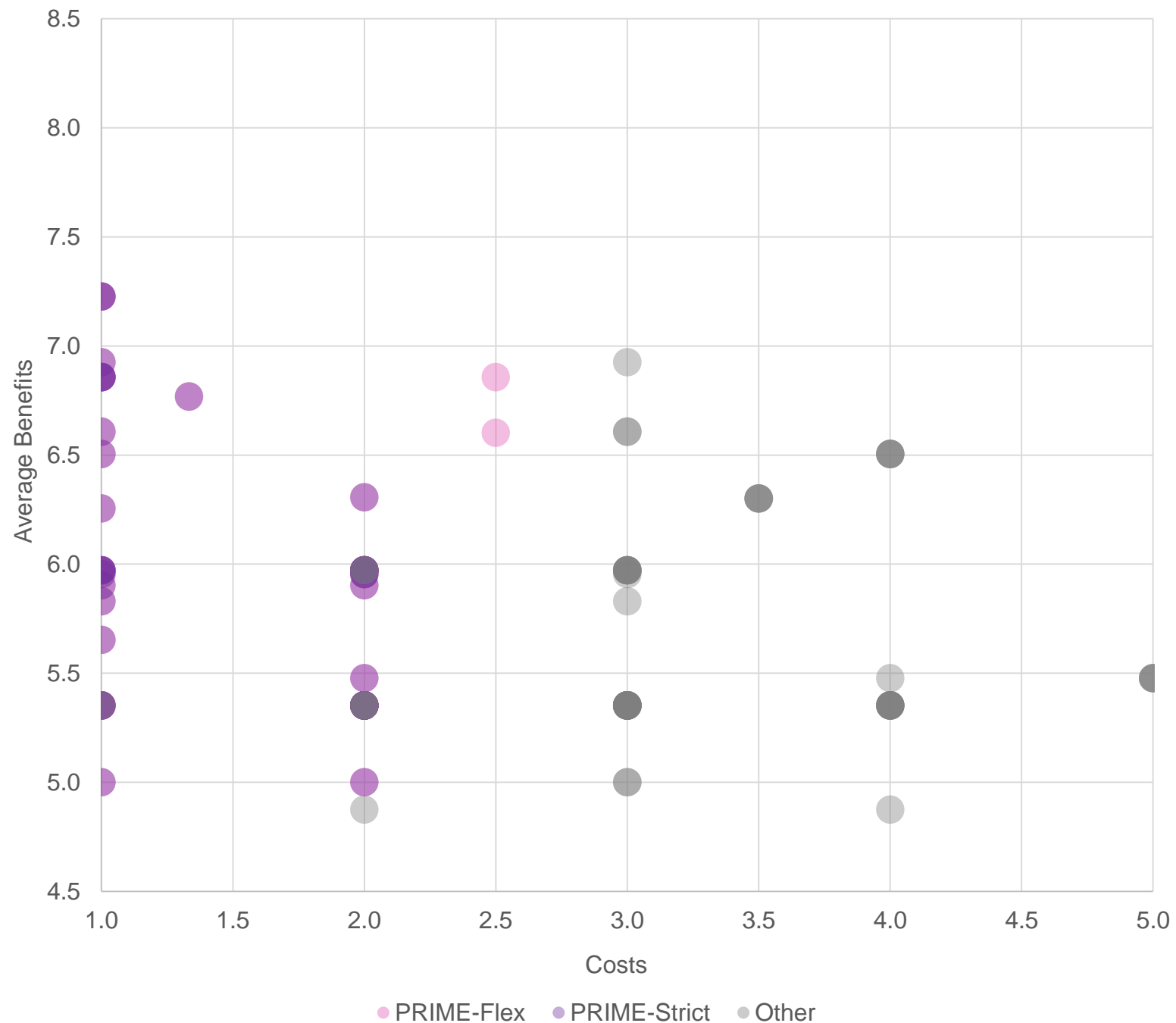
- Few parties submitted scores for the use-cases
- Technical variations are accounted for as distinct use-cases

3. Tradeoff of accounting for technical variations as distinct use-cases

- Downside: Limited ability to synthesize insights and have discussions
- Upside: More granularity in use-case assessment

# “Value now” thresholds can help recognize favorable use-cases on all three scoring metrics

- Two illustrative “value now” thresholds are applied to group scoring results:
- **PRIME-Strict** “value now” threshold: **41 use-cases**
  - Average Benefit: score  $\geq 5$
  - Average Cost: score  $\leq 2$
  - Average Implementability: score  $\geq 4$
- **PRIME-Flex** “value now” threshold: **43 use-cases**
  - Max Benefit: score  $\geq 5$
  - Min Cost: score  $\leq 2$
  - Max Implementability: score  $\geq 4$



# MHDV Use-cases

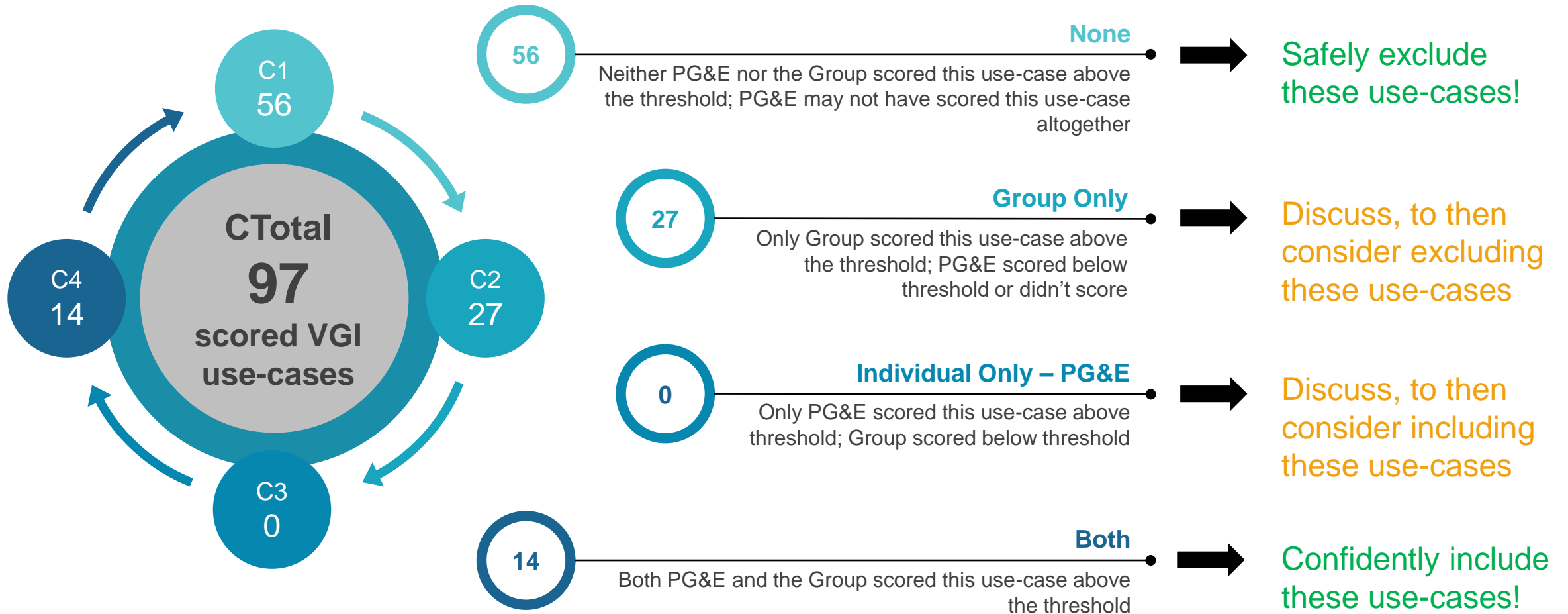
Group  
assessment

Individual  
assessment



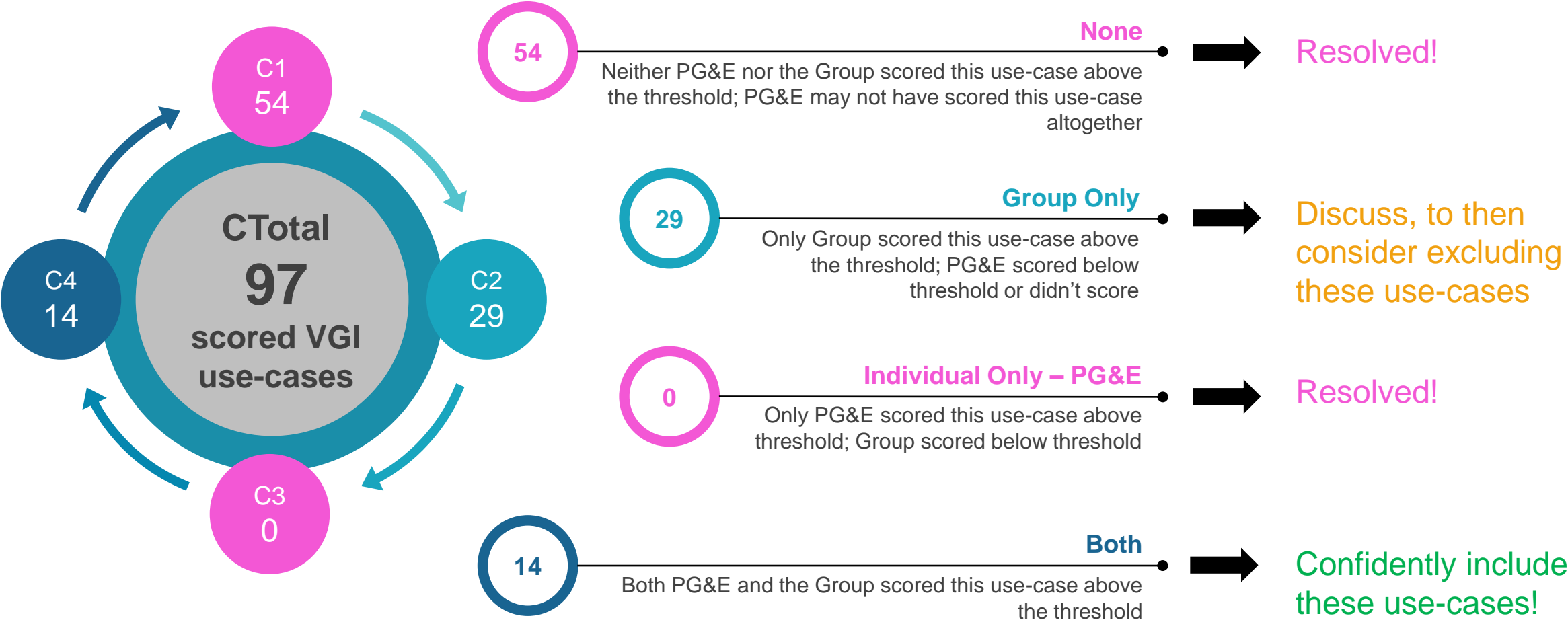
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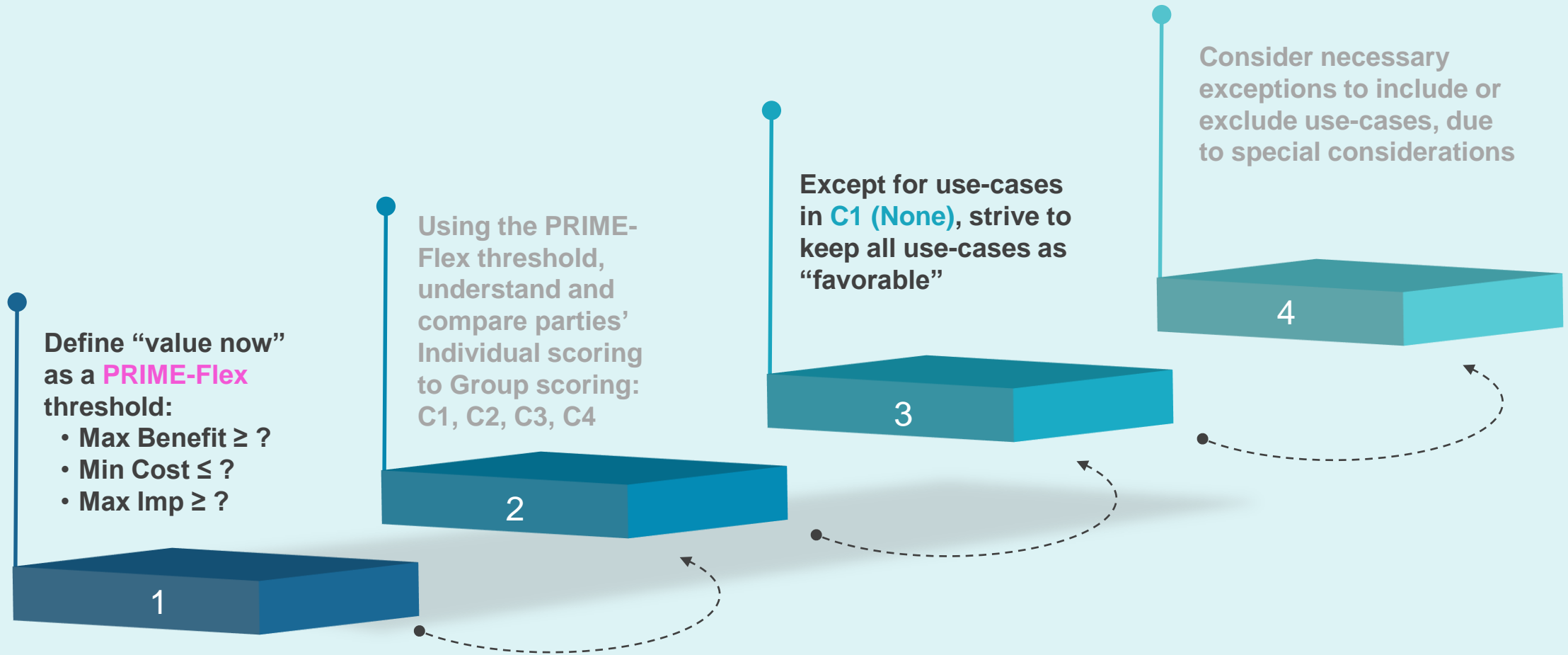


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# Process recommendations: to address PUC Question A



# Content recommendations: to address PUC Question A

## Answers to PUC Question A – Part 1: What use-cases can provide value now?

### ***Ambitious answer***

- LDV: All use-cases that pass the **PRIME-Flex** threshold (C1 excluded); total of 91 use-cases
- MHDV: All use-cases that pass the **PRIME-Flex** threshold (C1 excluded); total of 43 use-cases
- Additional use-cases for special considerations
  - LDV: Residential SFH, MUD, & Workplace / V2G / Customer & System Backup Resiliency
  - MHDV: School Bus / V1G and V2G / Customer Bill Management, System RA, Day-Ahead Energy

### ***Conservative answer***

- LDV: All use-cases that pass the **PRIME-Strict** threshold (C1 excluded); total of 59 use-cases
- MHDV: All use-cases that pass the **PRIME-Strict** threshold (C1 excluded); total of 41 use-cases
- Additional use-cases for special considerations
  - LDV: Residential SFH, MUD, & Workplace / V2G / Customer Backup Resiliency
  - MHDV: School Bus / V1G / Customer Bill Management, System RA

## Answer to PUC Question A – Part 2: How to capture this value?

- Capturing the value must consider, and is already engraved in, the very definition of the use-case, specifically in dimensions 4 “Approach” and dimension 5 “Resource Alignment”
- Beyond the “Approach” and “Resource Alignment” specs, parties can agree on more detailed ways to capture value

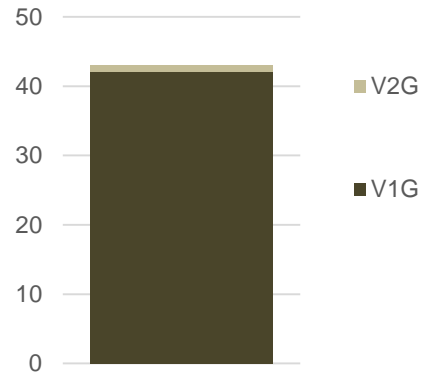
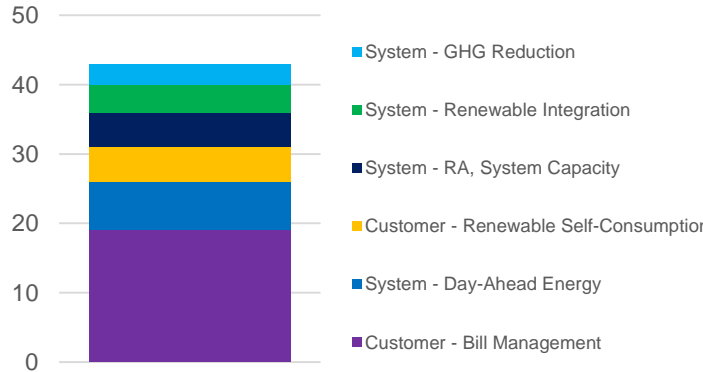
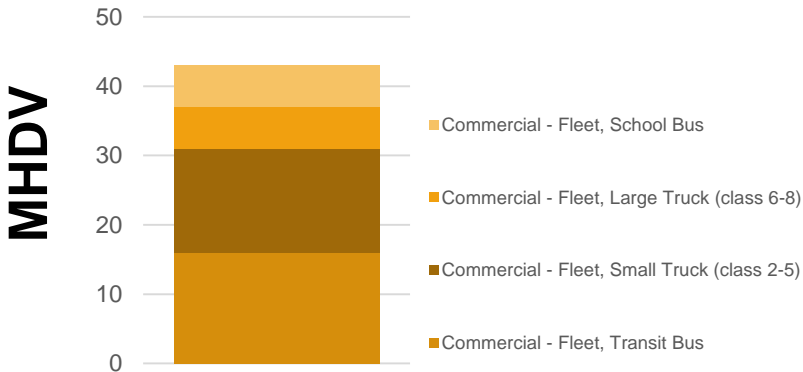
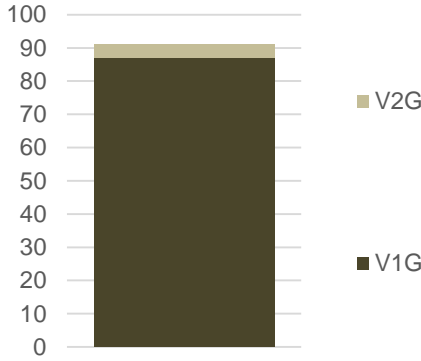
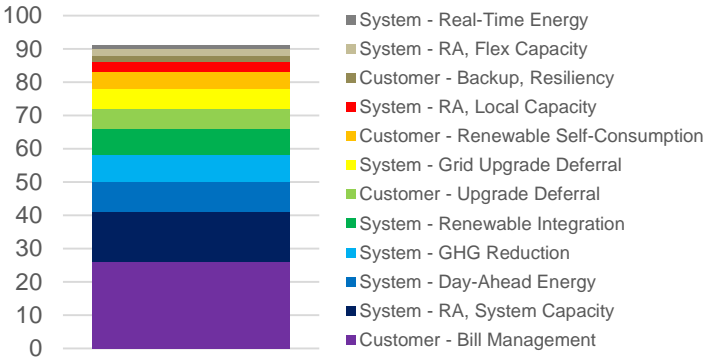
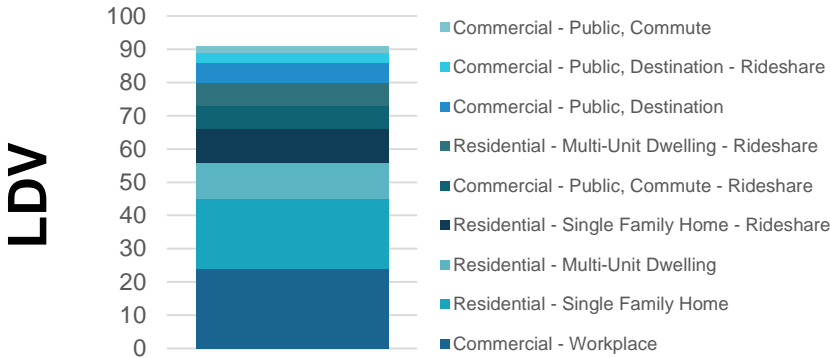


# Content recommendations: to address PUC Question A

## Answers to PUC Question A – Part 1: What use-cases can provide value now?

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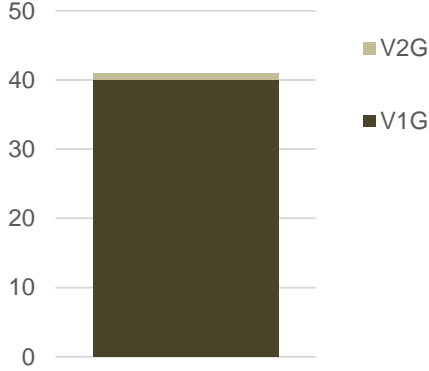
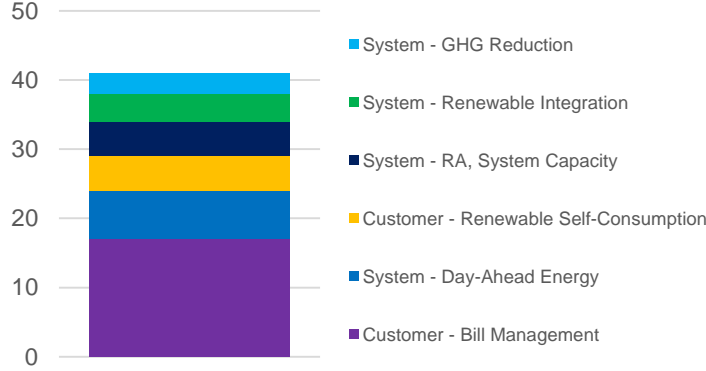
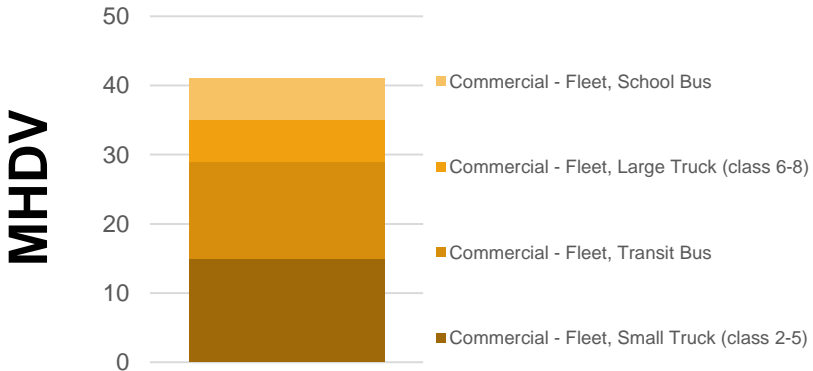
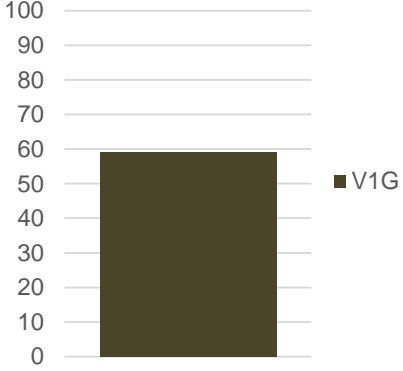
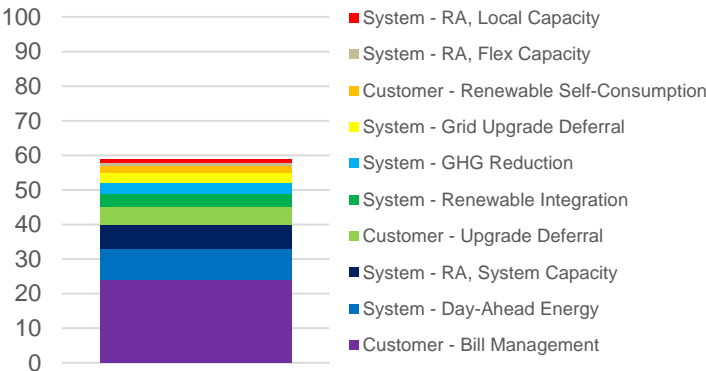
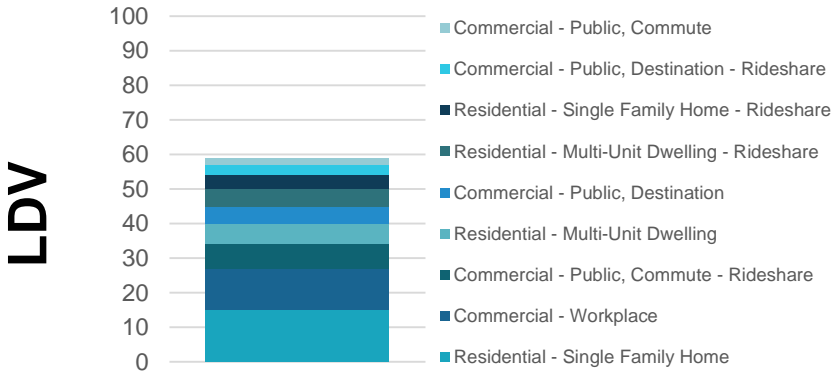
Focus should not be on one “dominant” or “winning” Sector or Application, but rather on the use-cases’ unique combinations and how these pieces “fit” together to create value

# Content recommendations: to address PUC Question A

## Answers to PUC Question A – Part 1: What use-cases can provide value now?

### Conservative answer

- LDV: All use-cases that pass the PRIME-Strict threshold (C1 excluded); total of 59 use-cases
- MHDV: All use-cases that pass the PRIME-Strict threshold (C1 excluded); total of 41 use-cases



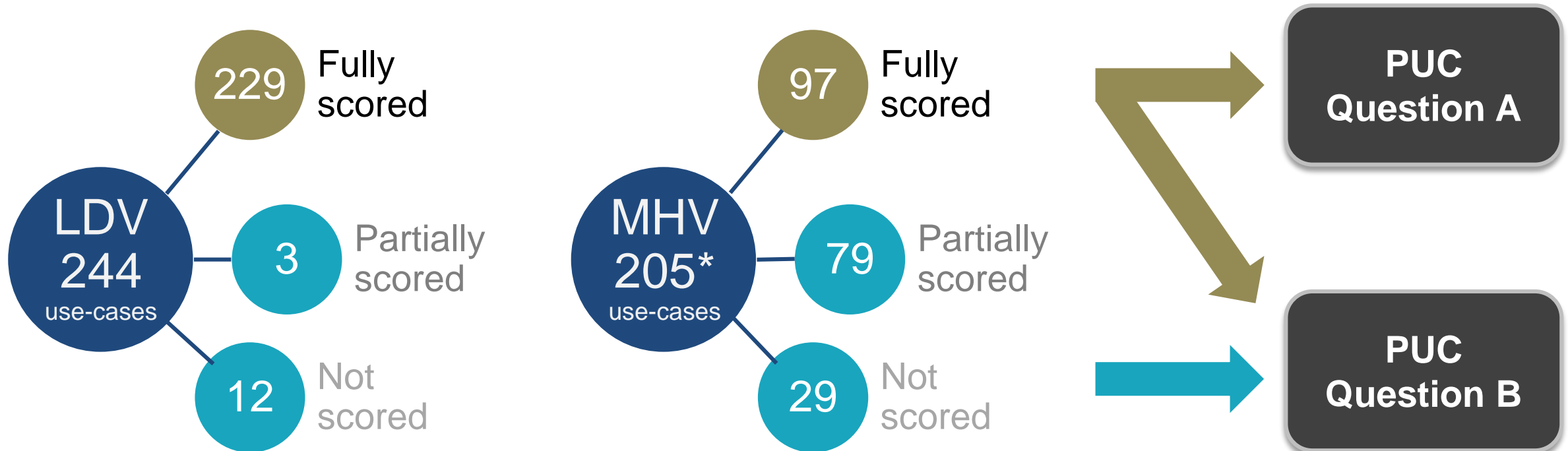
Focus should not be on one “dominant” or “winning” Sector or Application, but rather on the use-cases’ unique combinations and how these pieces “fit” together to create value

# Content recommendations: to address PUC Question A

## Answer to PUC Question A – Part 2: How to capture this value?

- Capturing the value must consider, and is already engraved in, the very definition of the use-case, specifically in dimensions 4 “Approach” and dimension 5 “Resource Alignment”
  - Example 1: A use-case that is “indirect” and “unified aligned” already states that capturing value should focus on: (1) effective price signaling (e.g. TOU rate design), and (2) ensuring that operational rules are designed such that there is one decision-maker (owner/operator) for the EV and EVSE.
  - Example 2: A use-case that is “direct” and “fragmented aligned” already states that capturing value should focus on: (1) effective dispatching on the top of price signaling (e.g. DR program design), and (2) ensuring that operational rules are designed such that the distinct EV and EVSE owners/operators are aligned.
- Beyond the “Approach” and “Resource Alignment” specs, parties can agree on more detailed ways to capture value

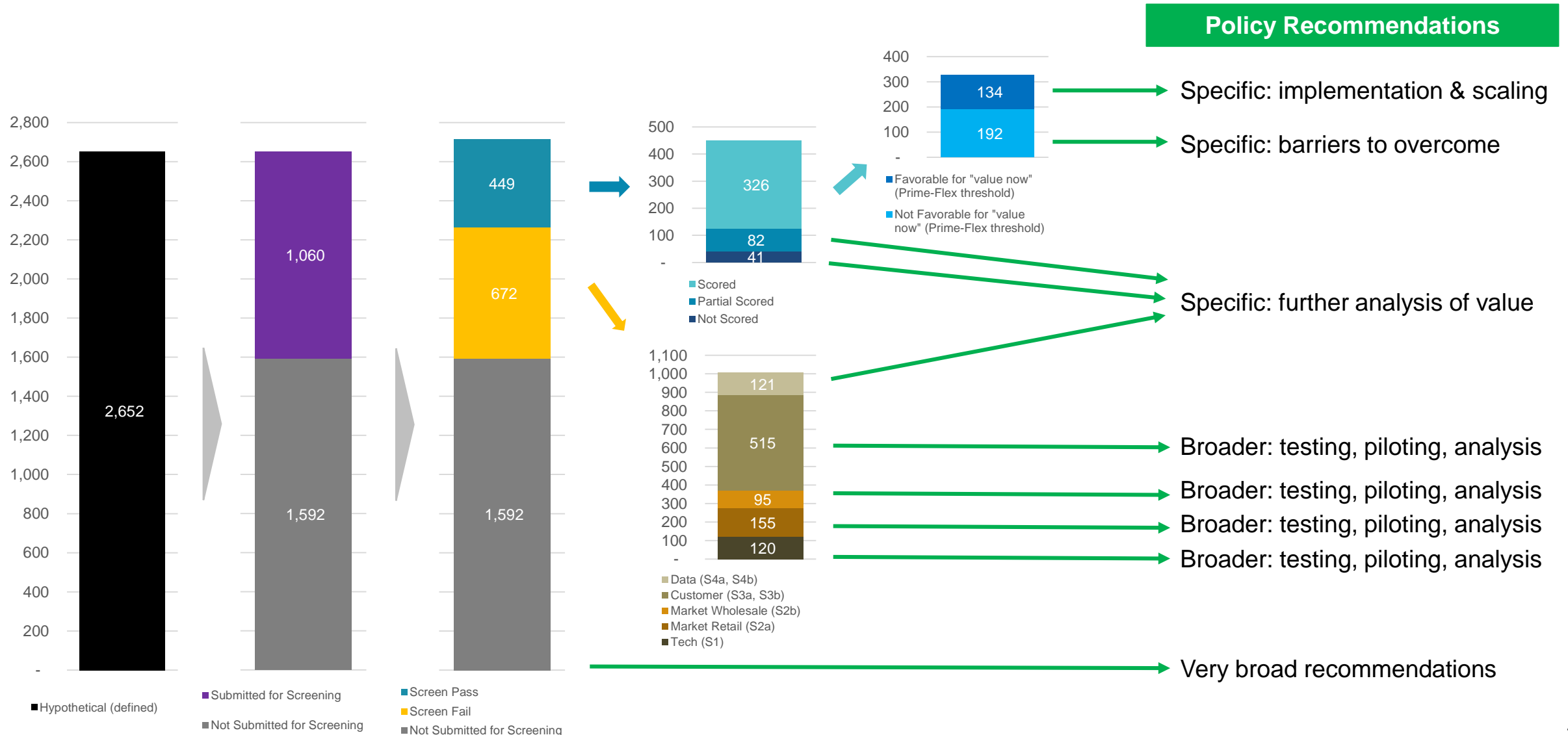
# Scoring data may be used to address PUC questions A and B



*\* NOTE: For MHV, the number of use-cases accounts for several technology variations of the same use-case. Without distinguishing technology variations, the number of unique use-cases is 109.*



# Looking ahead: Important to leverage the substantial use-case data available, to address Question B on policy recommendations



# THANK YOU

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# APPENDIX

## Recommendation to PUC Question A: What use-cases can provide value now?

### Ambitious Answer based on PRIME-Flex Threshold // LDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment
1.1	Residential - Single Family Home	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
1.2	Residential - Single Family Home	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
4.0	Residential - Single Family Home	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
13.1	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
13.2	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
16.0	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Direct	EV-EVSE Unified, Aligned
31.0	Residential - Single Family Home	Customer - Backup, Resiliency	V2G	Indirect	EV-EVSE Unified, Aligned
34.0	Residential - Single Family Home	Customer - Backup, Resiliency	V2G	Direct	EV-EVSE Unified, Aligned
37.0	Residential - Single Family Home	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned
49.0	Residential - Single Family Home	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
85.0	Residential - Single Family Home	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned
88.0	Residential - Single Family Home	System - Day-Ahead Energy	V1G	Direct	EV-EVSE Unified, Aligned
100.0	Residential - Single Family Home	System - Real-Time Energy	V1G	Direct	EV-EVSE Unified, Aligned
109.0	Residential - Single Family Home	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned
112.0	Residential - Single Family Home	System - Renewable Integration	V1G	Direct	EV-EVSE Unified, Aligned
121.0	Residential - Single Family Home	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned
124.0	Residential - Single Family Home	System - GHG Reduction	V1G	Direct	EV-EVSE Unified, Aligned
133.0	Residential - Single Family Home	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
136.0	Residential - Single Family Home	System - RA, System Capacity	V1G	Direct	EV-EVSE Unified, Aligned
148.0	Residential - Single Family Home	System - RA, Flex Capacity	V1G	Direct	EV-EVSE Unified, Aligned
160.0	Residential - Single Family Home	System - RA, Local Capacity	V1G	Direct	EV-EVSE Unified, Aligned
205.0	Residential - Single Family Home - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
208.0	Residential - Single Family Home - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
241.0	Residential - Single Family Home - Rideshare	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned
253.0	Residential - Single Family Home - Rideshare	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
256.0	Residential - Single Family Home - Rideshare	System - Grid Upgrade Deferral	V1G	Direct	EV-EVSE Unified, Aligned
292.0	Residential - Single Family Home - Rideshare	System - Day-Ahead Energy	V1G	Direct	EV-EVSE Unified, Aligned
313.0	Residential - Single Family Home - Rideshare	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned
328.0	Residential - Single Family Home - Rideshare	System - GHG Reduction	V1G	Direct	EV-EVSE Unified, Aligned
337.0	Residential - Single Family Home - Rideshare	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
340.0	Residential - Single Family Home - Rideshare	System - RA, System Capacity	V1G	Direct	EV-EVSE Unified, Aligned
410.0	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
413.1	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
413.2	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
414.0	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Misaligned
425.0	Residential - Multi-Unit Dwelling	Customer - Upgrade Deferral	V1G	Direct	EV-EVSE Fragmented, Aligned
458.0	Residential - Multi-Unit Dwelling	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
518.0	Residential - Multi-Unit Dwelling	System - Renewable Integration	V1G	Indirect	EV-EVSE Fragmented, Aligned
521.0	Residential - Multi-Unit Dwelling	System - Renewable Integration	V1G	Direct	EV-EVSE Fragmented, Aligned
533.0	Residential - Multi-Unit Dwelling	System - GHG Reduction	V1G	Direct	EV-EVSE Fragmented, Aligned
542.0	Residential - Multi-Unit Dwelling	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
545.0	Residential - Multi-Unit Dwelling	System - RA, System Capacity	V1G	Direct	EV-EVSE Fragmented, Aligned



## Recommendation to PUC Question A: What use-cases can provide value now?

### Ambitious Answer based on PRIME-Flex Threshold // LDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment
614.0	Residential - Multi-Unit Dwelling - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
617.0	Residential - Multi-Unit Dwelling - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
698.0	Residential - Multi-Unit Dwelling - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
725.0	Residential - Multi-Unit Dwelling - Rideshare	System - Renewable Integration	V1G	Direct	EV-EVSE Fragmented, Aligned
734.0	Residential - Multi-Unit Dwelling - Rideshare	System - GHG Reduction	V1G	Indirect	EV-EVSE Fragmented, Aligned
746.0	Residential - Multi-Unit Dwelling - Rideshare	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
749.0	Residential - Multi-Unit Dwelling - Rideshare	System - RA, System Capacity	V1G	Direct	EV-EVSE Fragmented, Aligned
817.0	Commercial - Workplace	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
818.0	Commercial - Workplace	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
820.0	Commercial - Workplace	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
821.0	Commercial - Workplace	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
822.0	Commercial - Workplace	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Misaligned
830.0	Commercial - Workplace	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
853.0	Commercial - Workplace	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned
854.0	Commercial - Workplace	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Fragmented, Aligned
860.0	Commercial - Workplace	Customer - Renewable Self-Consumption	V2G	Indirect	EV-EVSE Fragmented, Aligned
866.0	Commercial - Workplace	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
872.0	Commercial - Workplace	System - Grid Upgrade Deferral	V2G	Indirect	EV-EVSE Fragmented, Aligned
901.0	Commercial - Workplace	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned
902.0	Commercial - Workplace	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
925.0	Commercial - Workplace	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned
926.0	Commercial - Workplace	System - Renewable Integration	V1G	Indirect	EV-EVSE Fragmented, Aligned
937.0	Commercial - Workplace	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned
938.0	Commercial - Workplace	System - GHG Reduction	V1G	Indirect	EV-EVSE Fragmented, Aligned
949.0	Commercial - Workplace	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
950.0	Commercial - Workplace	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
952.0	Commercial - Workplace	System - RA, System Capacity	V1G	Direct	EV-EVSE Unified, Aligned
953.0	Commercial - Workplace	System - RA, System Capacity	V1G	Direct	EV-EVSE Fragmented, Aligned
964.0	Commercial - Workplace	System - RA, Flex Capacity	V1G	Direct	EV-EVSE Unified, Aligned
976.0	Commercial - Workplace	System - RA, Local Capacity	V1G	Direct	EV-EVSE Unified, Aligned
977.0	Commercial - Workplace	System - RA, Local Capacity	V1G	Direct	EV-EVSE Fragmented, Aligned
1022.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1024.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1025.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
1034.0	Commercial - Public, Destination	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
1153.0	Commercial - Public, Destination	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
1154.0	Commercial - Public, Destination	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
1226.0	Commercial - Public, Destination - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1228.0	Commercial - Public, Destination - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1310.0	Commercial - Public, Destination - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
1430.0	Commercial - Public, Commute	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1514.0	Commercial - Public, Commute	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned



## Recommendation to PUC Question A: What use-cases can provide value now?

### Ambitious Answer based on PRIME-Flex Threshold // LDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment
1633.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
1634.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1636.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1637.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
1718.0	Commercial - Public, Commute - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
1753.0	Commercial - Public, Commute - Rideshare	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned
1766.0	Commercial - Public, Commute - Rideshare	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned

## Recommendation to PUC Question A: What use-cases can provide value now?

### Ambitious Answer based on PRIME-Flex Threshold // MHDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment	Technology option
1837.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1837.3	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus B
1837.4	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus C
1837.5	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus A
1837.6	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1838.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Long Range Transit Bus A
1840.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1841.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned	Long Range Transit Bus A
1873.1	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1873.2	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1876.2	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Direct	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1921.2	Commercial - Fleet, Transit Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1921.3	Commercial - Fleet, Transit Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1945.2	Commercial - Fleet, Transit Bus	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1957.2	Commercial - Fleet, Transit Bus	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1969.2	Commercial - Fleet, Transit Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
2041	Commercial - Fleet, School Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	
2042	Commercial - Fleet, School Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	
2125	Commercial - Fleet, School Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2125	Commercial - Fleet, School Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2173	Commercial - Fleet, School Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2173	Commercial - Fleet, School Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2245	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	
2245.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2246	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	
2246.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Small Truck B
2248.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2281	Commercial - Fleet, Small Truck (class 2-5)	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2284	Commercial - Fleet, Small Truck (class 2-5)	Customer - Renewable Self-Consumption	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B

## Recommendation to PUC Question A: What use-cases can provide value now?

### Ambitious Answer based on PRIME-Flex Threshold // MHDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment	Technology option
2329	Commercial - Fleet, Small Truck (class 2-5)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2329.1	Commercial - Fleet, Small Truck (class 2-5)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2353	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2354	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Indirect	EV-EVSE Fragmented, Aligned	Small Truck B
2356	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2365	Commercial - Fleet, Small Truck (class 2-5)	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2368	Commercial - Fleet, Small Truck (class 2-5)	System - GHG Reduction	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2377	Commercial - Fleet, Small Truck (class 2-5)	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2449.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Large Truck A
2450.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Large Truck A
2452.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned	Large Truck A
2458.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V2G	Direct	EV-EVSE Unified, Aligned	Large Truck A
2533	Commercial - Fleet, Large Truck (class 6-8)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2581	Commercial - Fleet, Large Truck (class 6-8)	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	

## Recommendation to PUC Question A: What use-cases can provide value now?

### Conservative Answer based on PRIME-Strict Threshold // LDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment
1.1	Residential - Single Family Home	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
1.2	Residential - Single Family Home	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
4.0	Residential - Single Family Home	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
13.1	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
13.2	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
16.0	Residential - Single Family Home	Customer - Upgrade Deferral	V1G	Direct	EV-EVSE Unified, Aligned
49.0	Residential - Single Family Home	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Unified, Aligned
85.0	Residential - Single Family Home	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned
88.0	Residential - Single Family Home	System - Day-Ahead Energy	V1G	Direct	EV-EVSE Unified, Aligned
109.0	Residential - Single Family Home	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned
121.0	Residential - Single Family Home	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned
133.0	Residential - Single Family Home	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
136.0	Residential - Single Family Home	System - RA, System Capacity	V1G	Direct	EV-EVSE Unified, Aligned
148.0	Residential - Single Family Home	System - RA, Flex Capacity	V1G	Direct	EV-EVSE Unified, Aligned
160.0	Residential - Single Family Home	System - RA, Local Capacity	V1G	Direct	EV-EVSE Unified, Aligned
205.0	Residential - Single Family Home - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
208.0	Residential - Single Family Home - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
292.0	Residential - Single Family Home - Rideshare	System - Day-Ahead Energy	V1G	Direct	EV-EVSE Unified, Aligned
313.0	Residential - Single Family Home - Rideshare	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned
410.0	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
413.1	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
413.2	Residential - Multi-Unit Dwelling	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
458.0	Residential - Multi-Unit Dwelling	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
518.0	Residential - Multi-Unit Dwelling	System - Renewable Integration	V1G	Indirect	EV-EVSE Fragmented, Aligned
542.0	Residential - Multi-Unit Dwelling	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
614.0	Residential - Multi-Unit Dwelling - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
617.0	Residential - Multi-Unit Dwelling - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
698.0	Residential - Multi-Unit Dwelling - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
725.0	Residential - Multi-Unit Dwelling - Rideshare	System - Renewable Integration	V1G	Direct	EV-EVSE Fragmented, Aligned

## Recommendation to PUC Question A: What use-cases can provide value now?

### Conservative Answer based on PRIME-Strict Threshold // LDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment
734.0	Residential - Multi-Unit Dwelling - Rideshare	System - GHG Reduction	V1G	Indirect	EV-EVSE Fragmented, Aligned
817.0	Commercial - Workplace	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
818.0	Commercial - Workplace	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
820.0	Commercial - Workplace	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
821.0	Commercial - Workplace	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
830.0	Commercial - Workplace	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
853.0	Commercial - Workplace	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned
854.0	Commercial - Workplace	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Fragmented, Aligned
866.0	Commercial - Workplace	System - Grid Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
901.0	Commercial - Workplace	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned
902.0	Commercial - Workplace	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
949.0	Commercial - Workplace	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned
950.0	Commercial - Workplace	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
1022.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1024.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1025.0	Commercial - Public, Destination	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
1034.0	Commercial - Public, Destination	Customer - Upgrade Deferral	V1G	Indirect	EV-EVSE Fragmented, Aligned
1154.0	Commercial - Public, Destination	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned
1226.0	Commercial - Public, Destination - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1228.0	Commercial - Public, Destination - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1310.0	Commercial - Public, Destination - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
1430.0	Commercial - Public, Commute	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1514.0	Commercial - Public, Commute	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
1633.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned
1634.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned
1636.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned
1637.0	Commercial - Public, Commute - Rideshare	Customer - Bill Management	V1G	Direct	EV-EVSE Fragmented, Aligned
1718.0	Commercial - Public, Commute - Rideshare	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Fragmented, Aligned
1753.0	Commercial - Public, Commute - Rideshare	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned
1766.0	Commercial - Public, Commute - Rideshare	System - RA, System Capacity	V1G	Indirect	EV-EVSE Fragmented, Aligned



## Recommendation to PUC Question A: What use-cases can provide value now?

### Conservative Answer based on PRIME-Strict Threshold // MHDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment	Technology option
1837.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1837.3	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus B
1837.4	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus C
1837.5	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus A
1837.6	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1838.2	Commercial - Fleet, Transit Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Long Range Transit Bus A
1873.1	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1873.2	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1876.2	Commercial - Fleet, Transit Bus	Customer - Renewable Self-Consumption	V1G	Direct	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1921.2	Commercial - Fleet, Transit Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1921.3	Commercial - Fleet, Transit Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Short Range Transit Bus B
1945.2	Commercial - Fleet, Transit Bus	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1957.2	Commercial - Fleet, Transit Bus	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
1969.2	Commercial - Fleet, Transit Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	Long Range Transit Bus A
2041	Commercial - Fleet, School Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	
2042	Commercial - Fleet, School Bus	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	
2125	Commercial - Fleet, School Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2125	Commercial - Fleet, School Bus	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2173	Commercial - Fleet, School Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2173	Commercial - Fleet, School Bus	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2245	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	
2245.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2246	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	
2246.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Small Truck B
2248.1	Commercial - Fleet, Small Truck (class 2-5)	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2281	Commercial - Fleet, Small Truck (class 2-5)	Customer - Renewable Self-Consumption	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2284	Commercial - Fleet, Small Truck (class 2-5)	Customer - Renewable Self-Consumption	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2329	Commercial - Fleet, Small Truck (class 2-5)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2329.1	Commercial - Fleet, Small Truck (class 2-5)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B

## Recommendation to PUC Question A: What use-cases can provide value now?

### Conservative Answer based on PRIME-Strict Threshold // MHDV

Use case ID	Sector	Application	Type	Approach	Resource Alignment	Technology option
2353	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2354	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Indirect	EV-EVSE Fragmented, Aligned	Small Truck B
2356	Commercial - Fleet, Small Truck (class 2-5)	System - Renewable Integration	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2365	Commercial - Fleet, Small Truck (class 2-5)	System - GHG Reduction	V1G	Indirect	EV-EVSE Unified, Aligned	Small Truck B
2368	Commercial - Fleet, Small Truck (class 2-5)	System - GHG Reduction	V1G	Direct	EV-EVSE Unified, Aligned	Small Truck B
2377	Commercial - Fleet, Small Truck (class 2-5)	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	
2449.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Indirect	EV-EVSE Unified, Aligned	Large Truck A
2450.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Indirect	EV-EVSE Fragmented, Aligned	Large Truck A
2452.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V1G	Direct	EV-EVSE Unified, Aligned	Large Truck A
2458.1	Commercial - Fleet, Large Truck (class 6-8)	Customer - Bill Management	V2G	Direct	EV-EVSE Unified, Aligned	Large Truck A
2533	Commercial - Fleet, Large Truck (class 6-8)	System - Day-Ahead Energy	V1G	Indirect	EV-EVSE Unified, Aligned	
2581	Commercial - Fleet, Large Truck (class 6-8)	System - RA, System Capacity	V1G	Indirect	EV-EVSE Unified, Aligned	