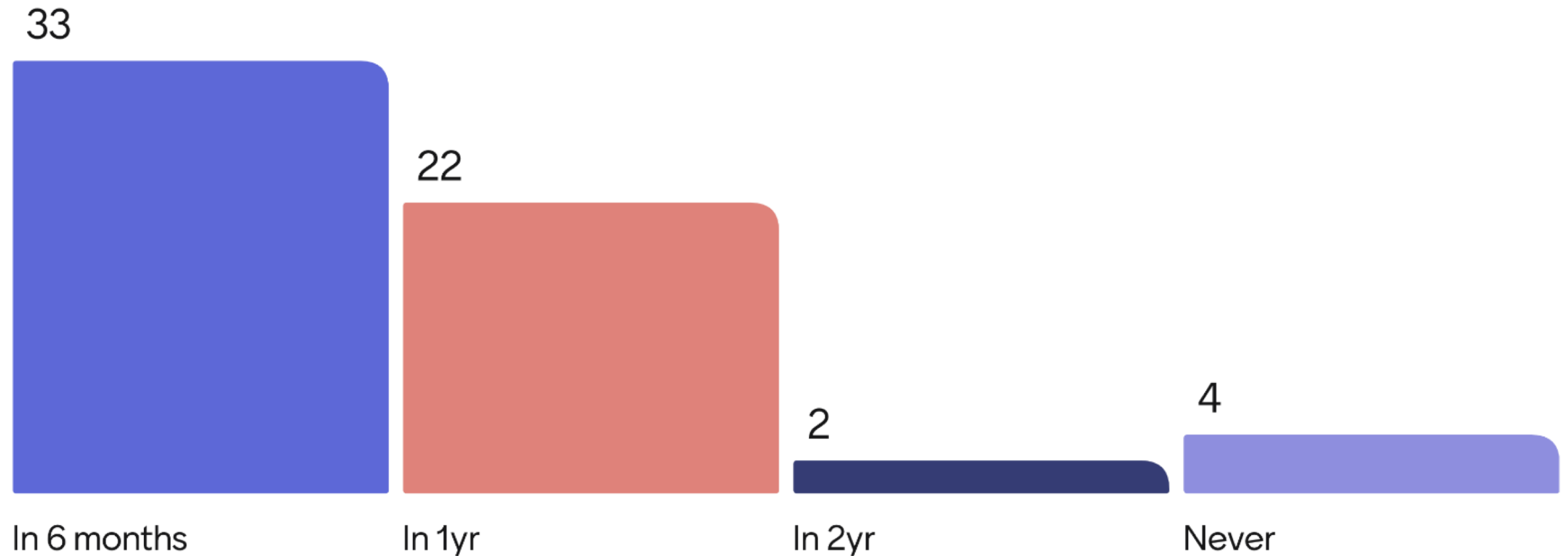


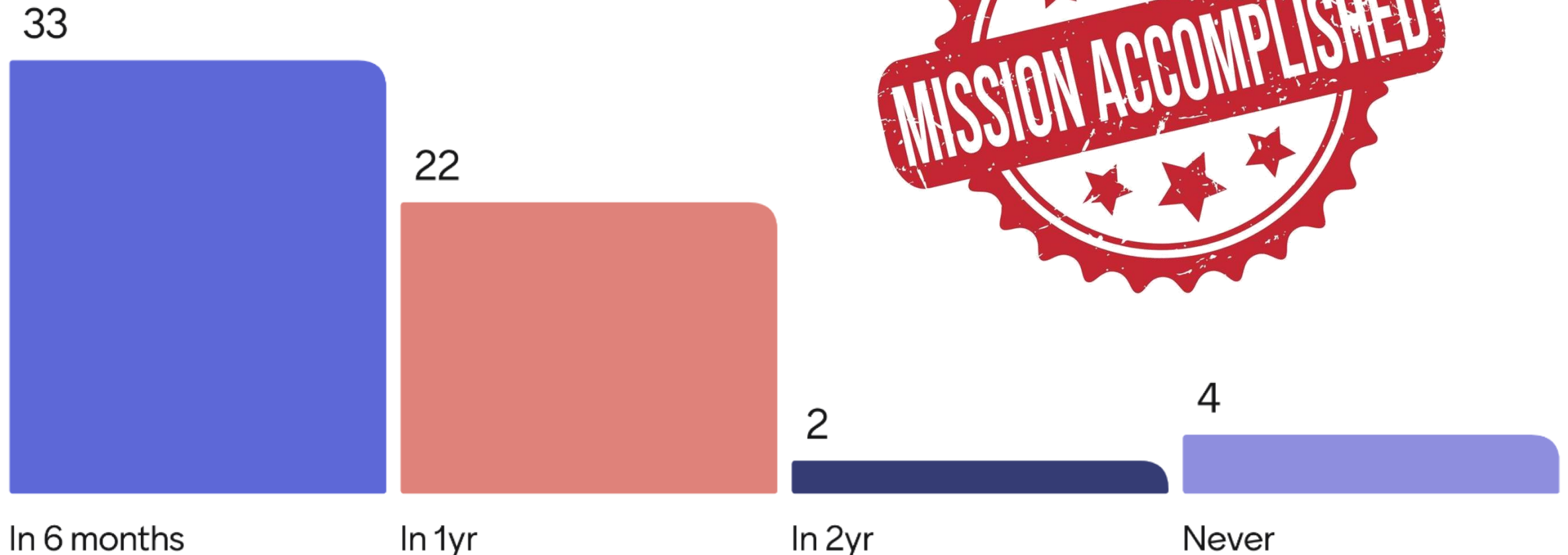
Closeout

BJPJ

This meeting should happen again...



This meeting should happen again...



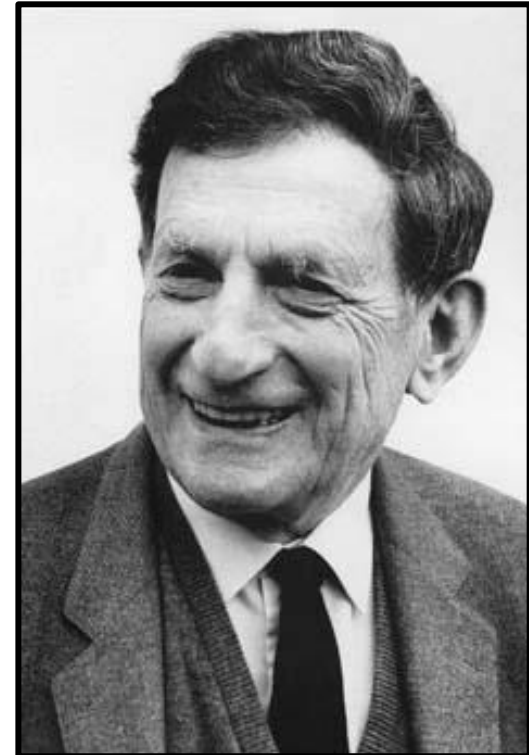
WELCOME TO OLD TRAFFORD



Did we actually achieve anything, though?

- This meeting, we tried to understand peoples visions for the direction of our field through the pathfinder discussions, rather than through mentimeter polls.
- This gives more opportunity for dialog.

"In Nature nothing remains constant. Everything is in a perpetual state of transformation, motion and change." ~ David Bohm





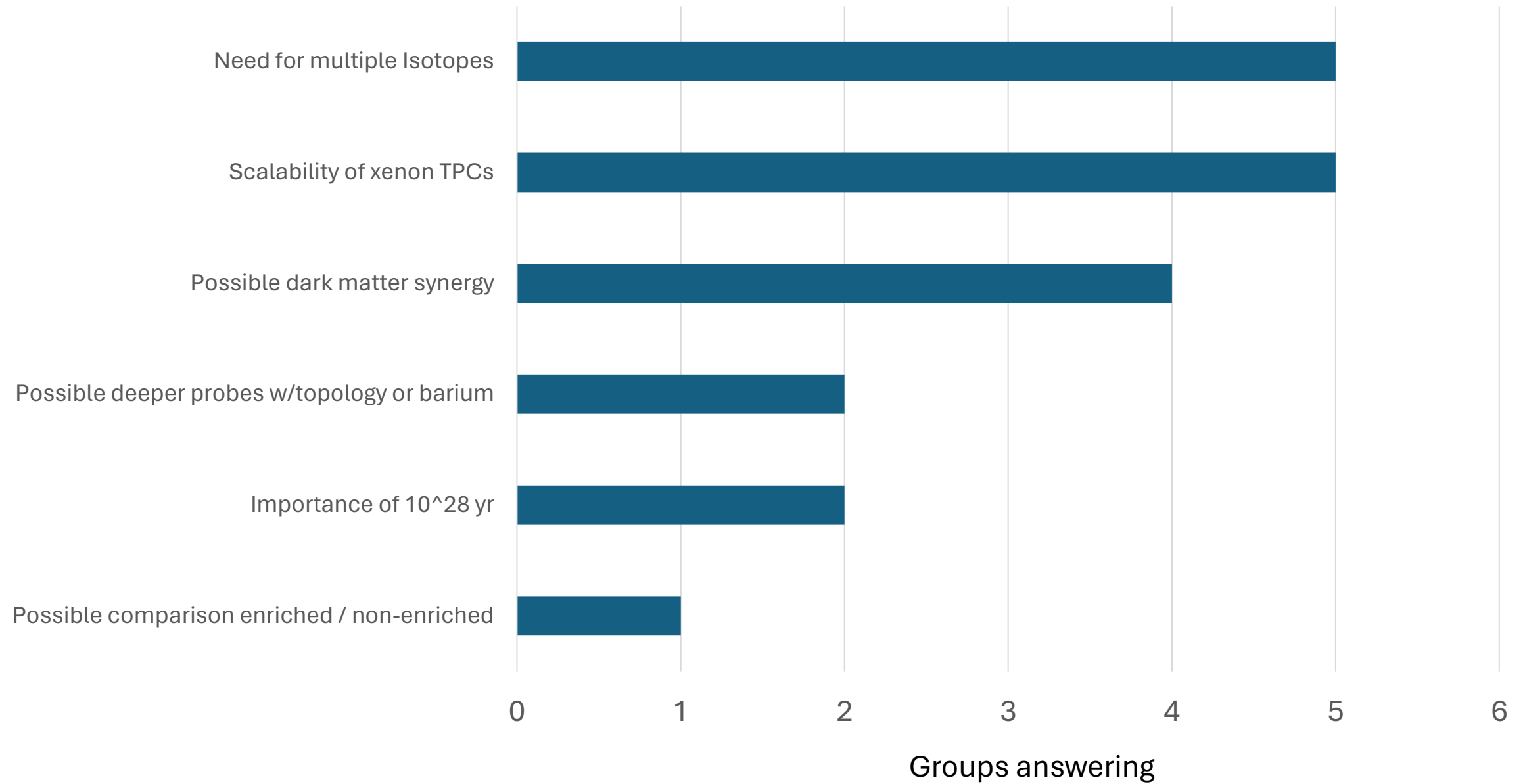
Question 1:

Why are we here? What are the arguments to push for a new Xe experiment in the current context?

Why don't we all join LEGEND?

Write down the arguments (~1 paragraph)

5min



Question 2

Many think that we don't have the critical mass for the next Xe experiment.
What would the conditions need to be for you to get behind a single project with:

- 1) Gas xenon technology
- 2) Liquid xenon technology with enriched ^{136}Xe
- 3) Liquid xenon technology with natural Xenon
- 4) Very large liquid-scintillator + balloon with ^{136}Xe
- 5) LEGEND

20 min

Question 2

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20 min

We all know the technical pro's and con's, though we mostly agree that technically all approaches can in principle reach 10^{28} yr (per vote last meeting)

Preferences are motivated by 1) sociological factors and 2) perceptions about which program is more likely to successfully proceed for the long haul, without hitting the chopping block.

Most groups did not engage with the “what would it take” question directly, but several outlined some of the sociological points they think are important.

Key “non-technical” factors highlighted:

Major physics goal needs to be compelling (in this context, we mostly agree 10^{28} yr is so) (2~3 groups).

Timeliness of delivery of primary physics goal is important (3 groups)

Intermediate timescale scientific milestones needed to maintain engagement for the long period and many generations of trainees required for delivery (2 groups).

Scientists are motivated by having something interesting to do in an experiment, and opportunity to apply their skills in meaningful ways (3 groups)

Need an engaging project with leadership opportunities for young scientists, and paths for promotion within the collaboration and the field (2 groups).

The experiment needs to be part of a program that has R&D opportunities and a pathway to the future (2 groups).

Question 4

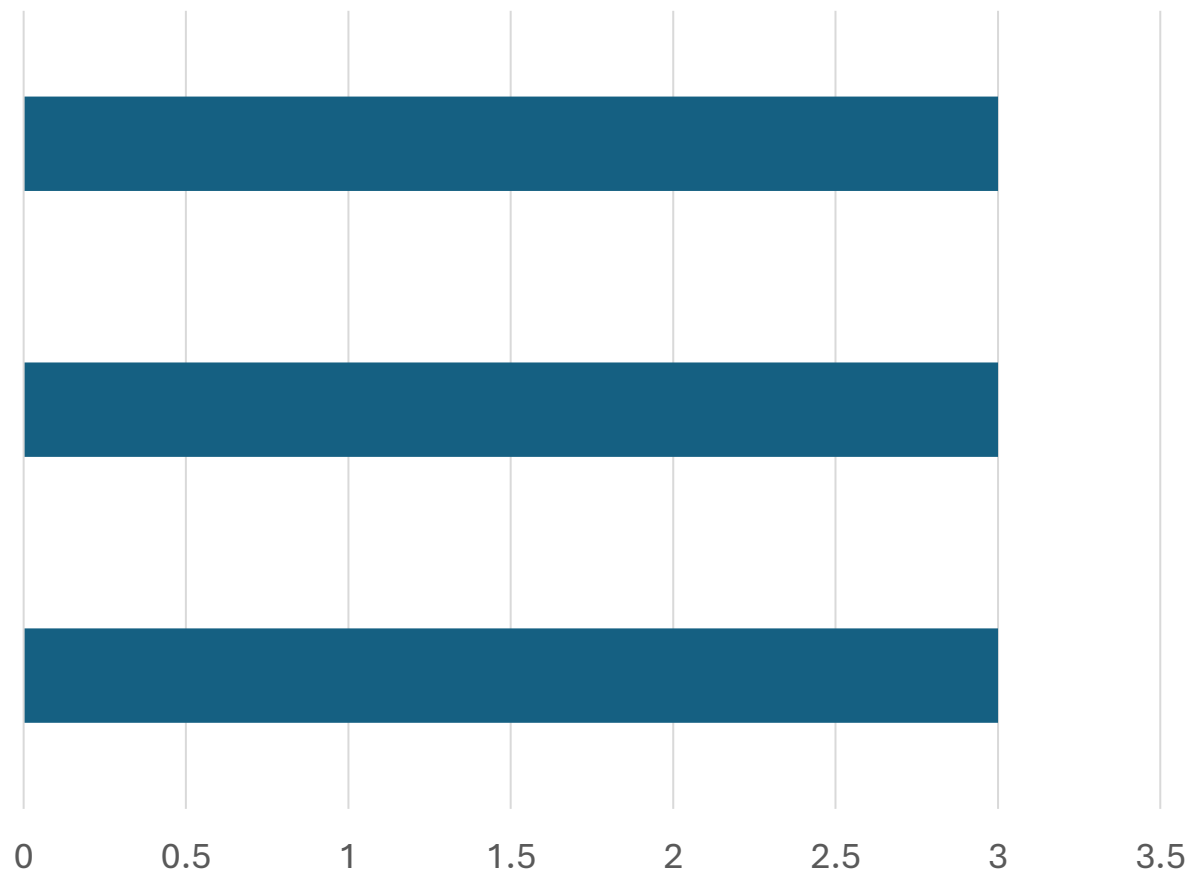
Currently there is 500kg of ^{136}Xe available to use (some of it un-used). What is the best use of this resource (estimated ~ 35M\$)?

In about ~ 5 years and additional 800kg (from KamLand-Zen) will become available (additional ~ 60M\$) making 1.3 tonne. What is the best way to use this resource?

This xenon could be a distraction / leave it where it is

Discussion of mixing into LZ or XLZD

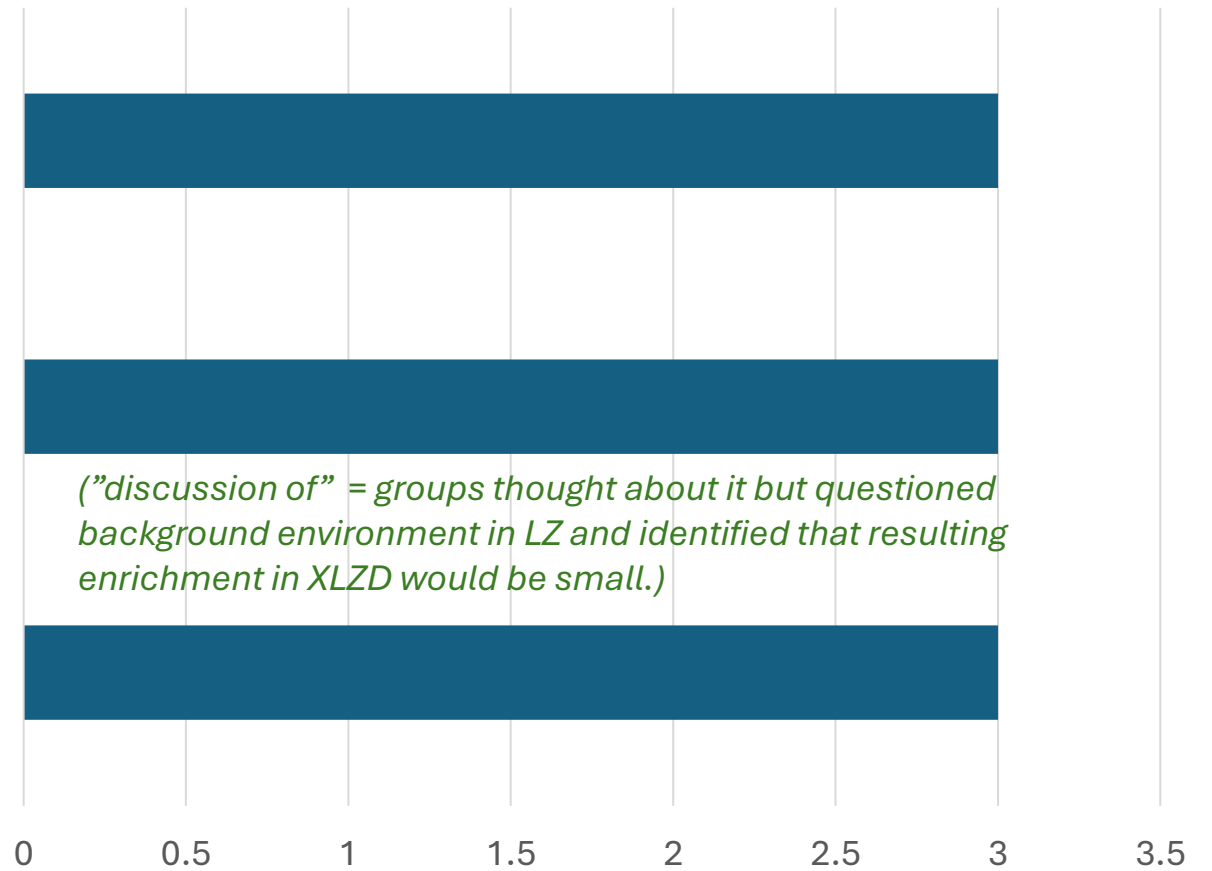
Intermediate scale gas TPC is good use



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Discussion of mixing into LZ or XLZD

Intermediate scale gas TPC is good use



Question 6

What do you think is needed (e.g. outcome of these workshops) to help secure a next-generation xenon experiment?

What does the community need to do to help convince funding agencies?

15 min

Answers to this question are all over the map.

- Clear both from Q6 responses and from informal chats at this meeting that we don't have consensus about whether we should even aim for consensus.
- Answers to Q6 ranged over:
 - Aim to build a large consortium with sufficient person power to field a 10^{28} yr experiment.
 - Determine a single experiment for everyone to join
 - Develop mutually supportive / synergistic R&D programs
 - Outline a coherent program that supports all national interests, not necessarily within a single experiment
 - Make another community statement
 - Change perception that community does not want to / does not work together
 - Advocate to governments (funding agencies aren't the ones who need convincing)

3. Neutrino Properties: Preliminary Recommendations (as of Sep 3, 2026)

Three subtopics: **Neutrinoless double beta decay**, direct neutrino mass determination and neutrino oscillations, ordering and CP violation reviewed by O. Cremonesi, C. Gonzalez Garcia, A. Ianni (SAC chair), J. Kopp, M. Kuzniak, O. Lahav, N. Rossi, F. Simkovicz and Christian Weinheimer (chair).

APPEC fully prioritizes the construction of LEGEND-1000 based on Ge-76, the current experiment aiming to reach the highest sensitivity, and CUPID based on Mo-100. The APPEC-strongly-supported dark matter experiment XLZD experiment* as well as the gaseous Xe-136 NEXT program will have an important impact on 0nbb searches in Xe-136. The international competition in neutrinoless double beta decay searches makes timely funding a critical factor.

APPEC recognizes the need for a neutrino mass measurement in the lab and R&D for detecting the relic neutrinos. APPEC fully prioritizes the completion of coordinated R&D programs built on the successful KATRIN experiment, aim to reach ~50 meV sensitivity and beyond through innovations such as quantum sensing and sources with sharp spectral features like atomic tritium.

APPEC recognizes the complementarity of accelerator neutrinos and neutrino telescopes in determining neutrino parameters. APPEC fully prioritizes the large European contribution to the completion and exploitation of the long-baseline accelerator experiments Hyper-Kamiokande and DUNE and exploitation of the reactor experiment JUNO. APPEC recognizes the huge perspectives of coherent elastic neutrino nucleus scattering for neutrino physics.

C. Weinheimer, APPEC TM

Could we have been better reflected in documents like this one, by being more coherent?

Answers to this question are all over the map.

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Lets talk about this. Do we want another workshop? Do we want more documents? Is there hope to converge on a consistent vision? Do we need one?