



Lunar Surface Innovation

C O N S O R T I U M

Extreme Access Focus Group Telecon

November 12, 2020

Dr. Angela Stickle
Senior Research Scientist
JHU Applied Physics Laboratory

Facilitator_ExtremeAccess@jhuapl.edu



Today's Agenda

- Communications
- Fall Meeting Discussion
- Upcoming Opportunities
- Talk from Lunar Outpost
- Open floor and Discussion

- Monthly LSIC newsletter –edition came out last week
 - <http://lsic.jhuapl.edu/Resources/>
- Mailing list
 - The listserv goes to all participants. Use with caution. But feel free to use!
 - Follow the Code of Conduct, found on the Resources webpage
- Updates to the webpage - <http://lsic.jhuapl.edu/Focus-Areas/Extreme-Access.php>
 - Notes, slides, recordings from telecons posted here
- Wiki is ready!
 - Confluence is free to you and available to all registered LSIC members
 - To request an account, please email Andrea Harman: ams573@alumni.psu.edu
- Lightning Talks at monthly telecons
 - Anyone can volunteer to give a lightning talk (10-15 mins)
 - Email Angela to sign up!

Follow the Code of Conduct for all Focus Group communications



Pages

Blog

PAGE TREE

EA Conversations

EA Monthly Meeting

November 12, 2020

- Lightning talk from Lunar Outpost
- LSIC Fall Meeting Recap and Discussion

10 September 2020

13 August 2020

09 July 2020

18 June 2020

November 12, 2020

Created by Angela Stickle, last modified on Nov 10, 2020

- Lightning talk from Lunar Outpost
- LSIC Fall Meeting Recap and Discussion

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No labels



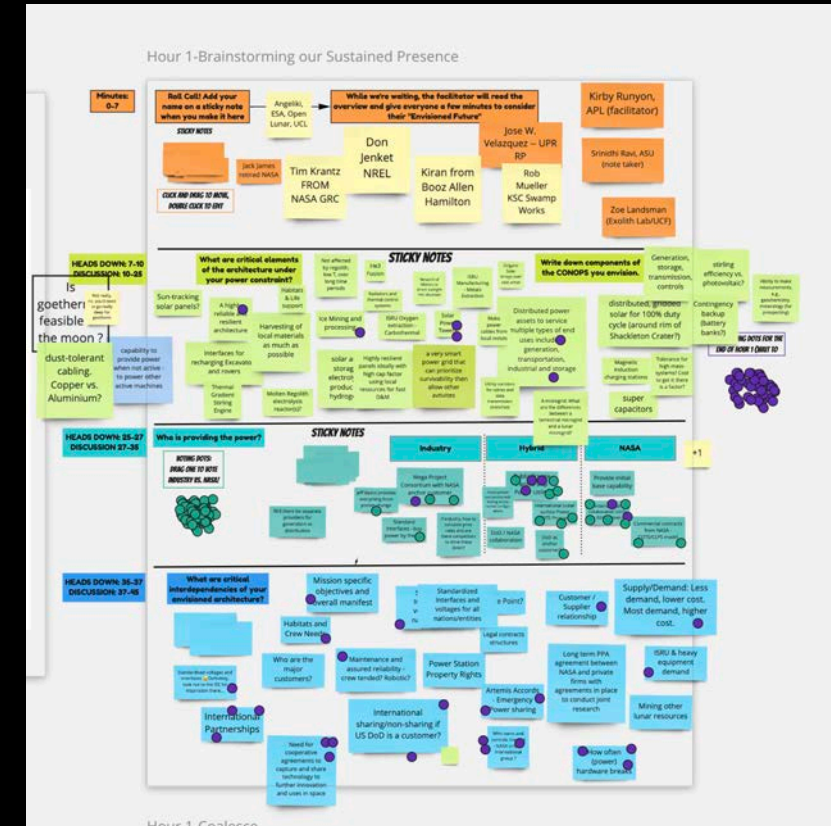
Write a comment...

Content posted to LSIC must be approved for public release. Remember to safeguard your intellectual property when sharing information, as this forum is open to all the members of LSIC. Please keep LSIC's code of conduct (available on homepage) in mind when posting.

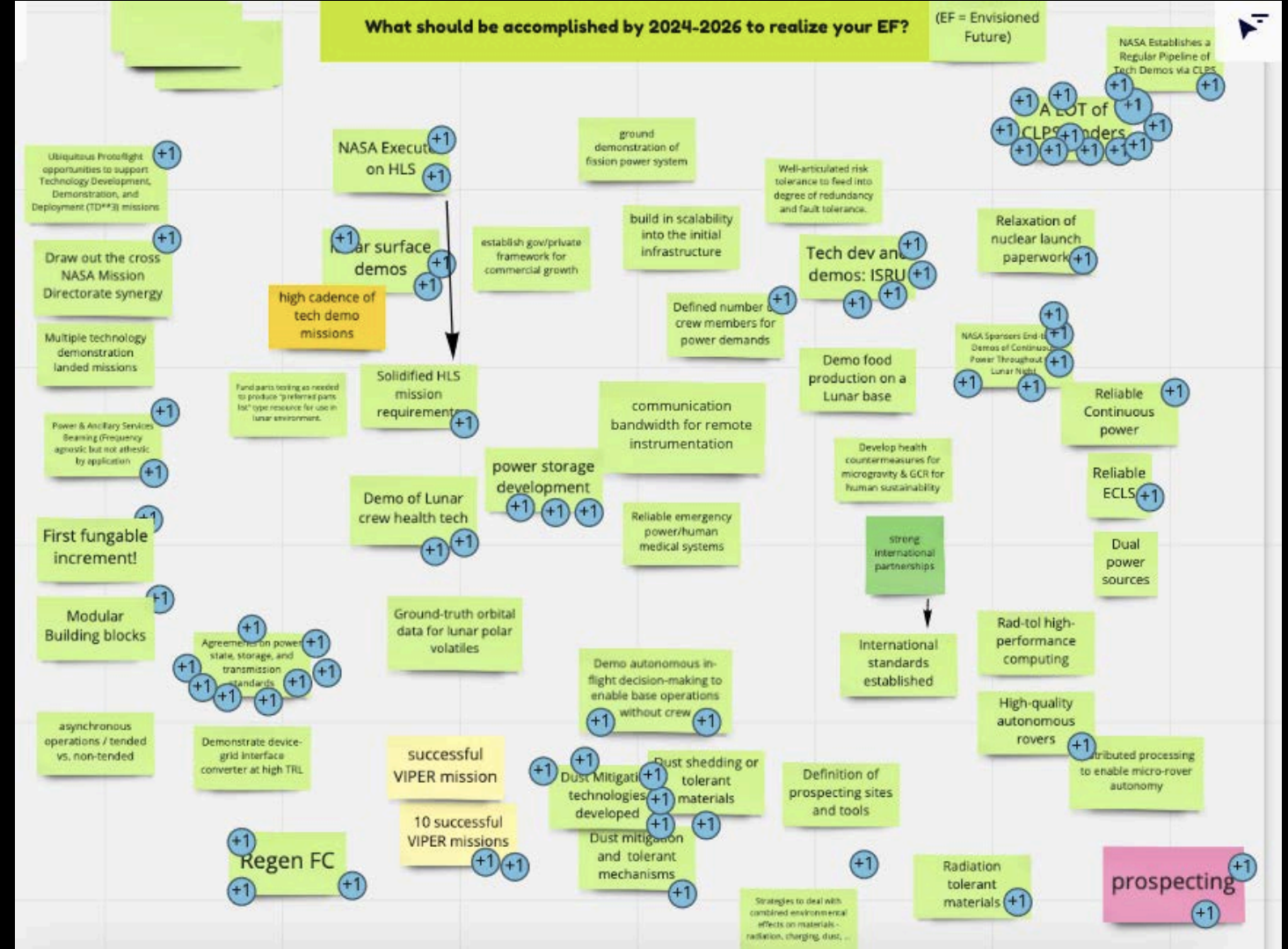
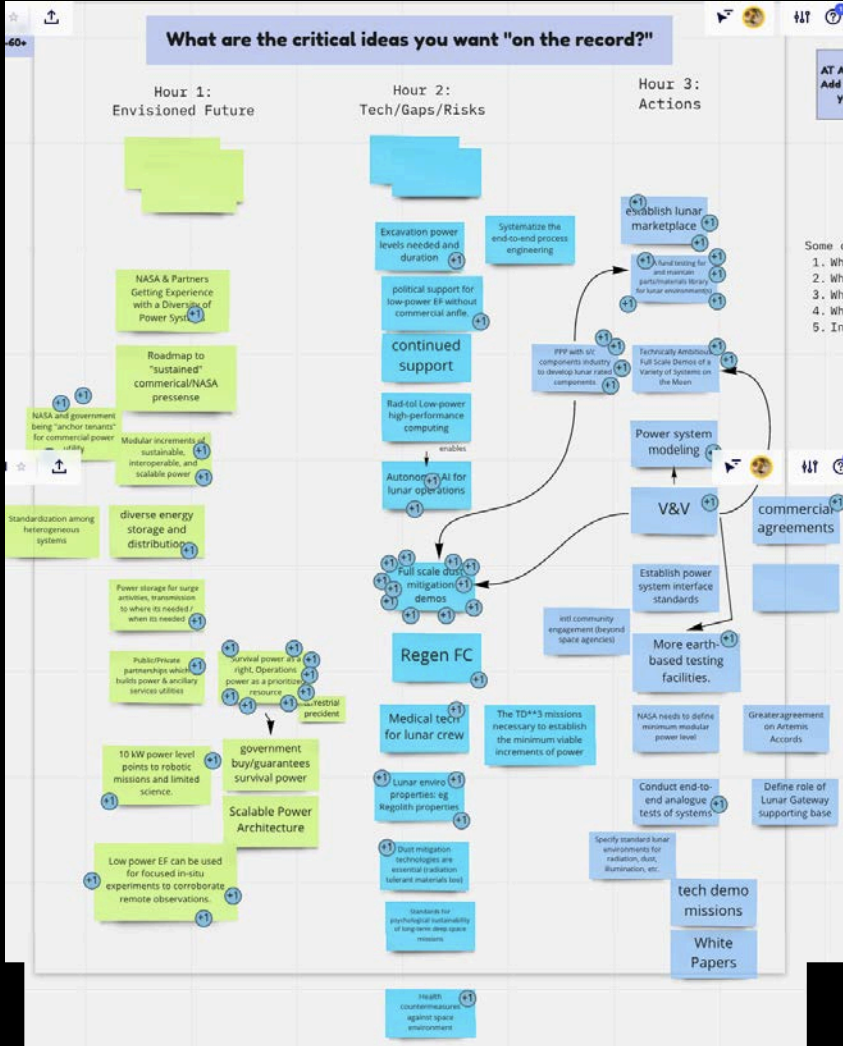


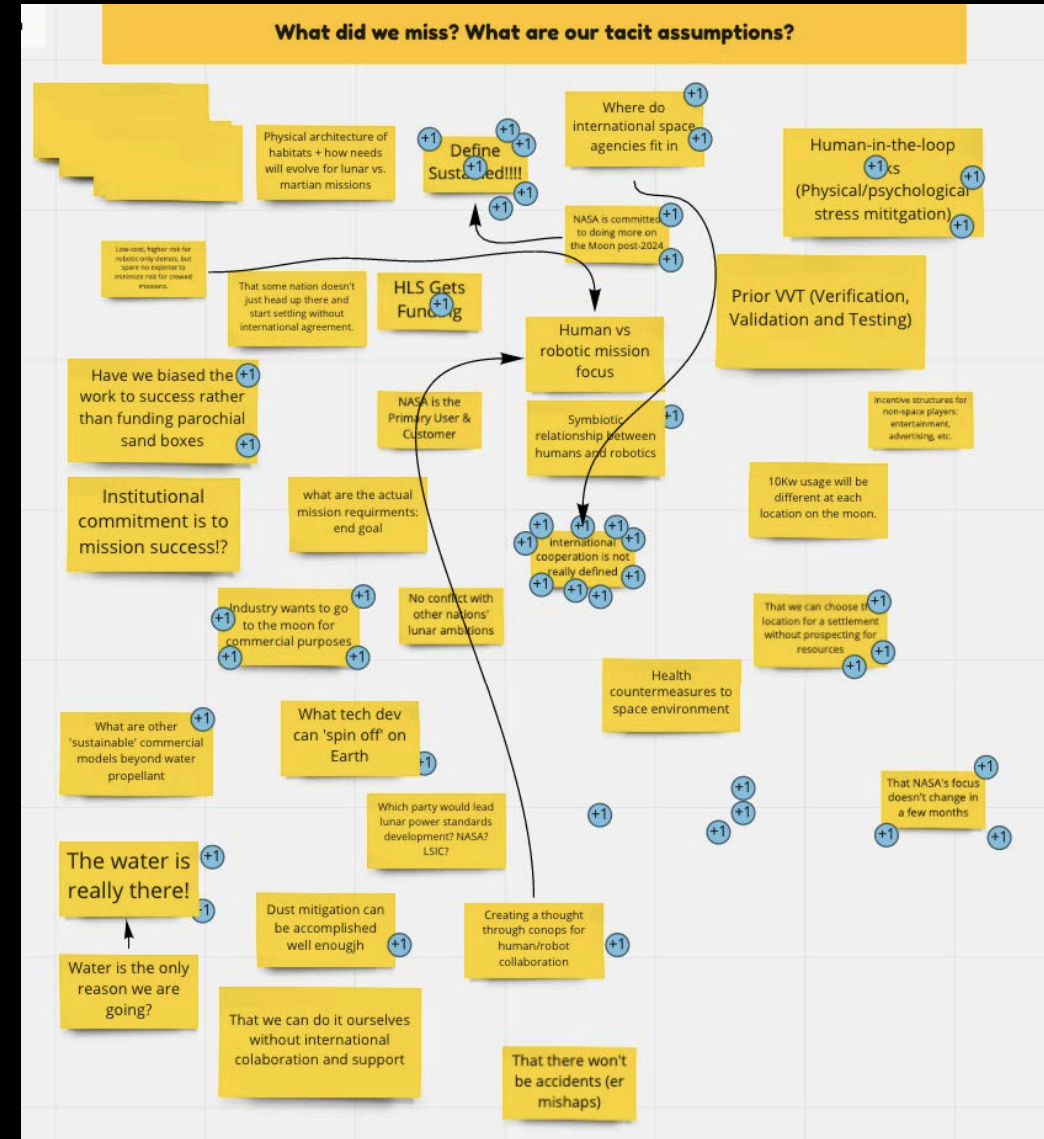
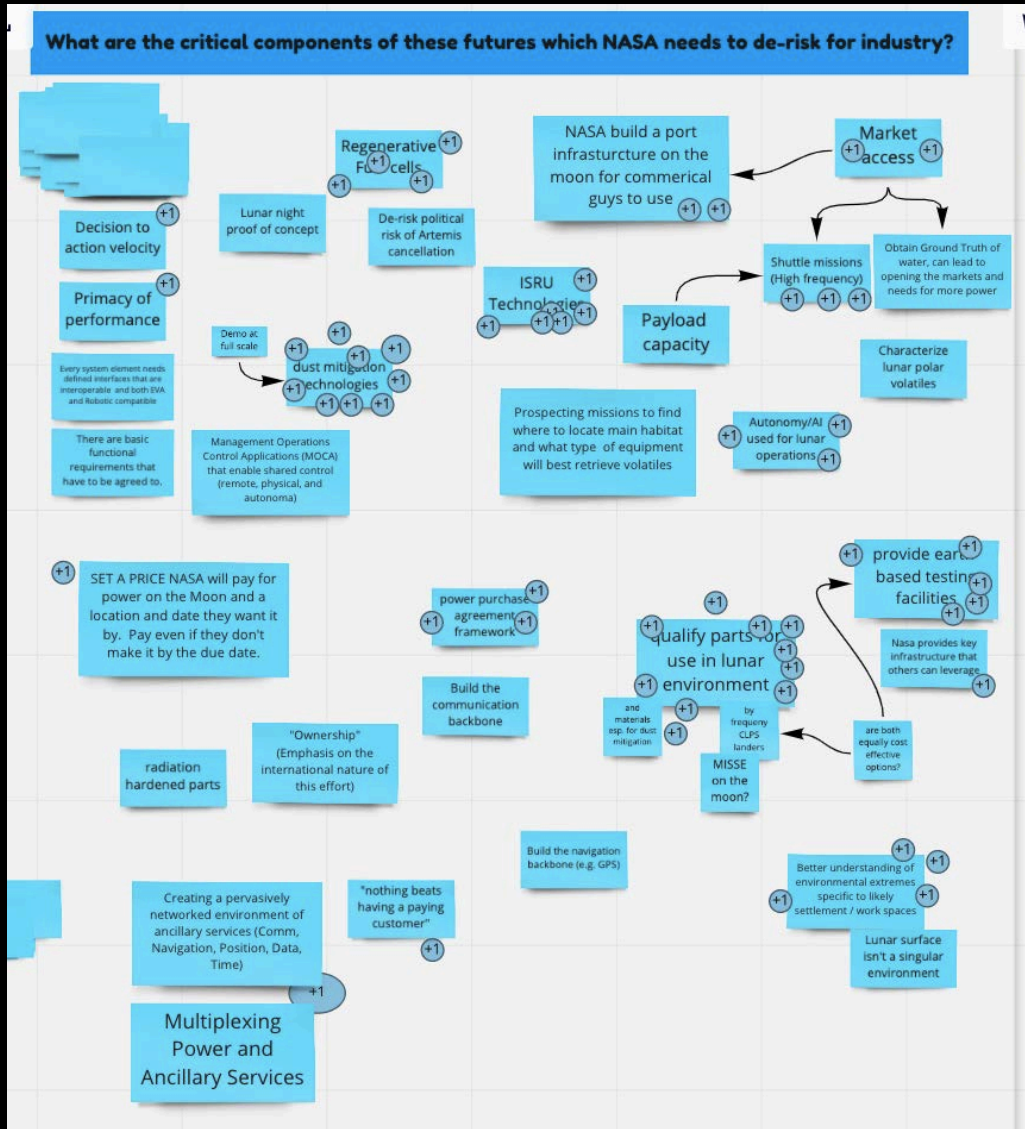
Fall meeting recap

- Thank you to everyone who participated in the LSIC Fall Meeting!
- We are working to distill all the collected information
 - A full outbrief likely to be at the next LSIC Surface Power Focus Group telecon.
 - All focus groups will be invited
- Breakout Session 1 – Envisioned Futures on the lunar surface (9 groups, 3 each level)
 - Constrained by 3 power categories
 - 10 kW continuous power (low)
 - 100 kW with 70% duty cycle (medium)
 - > 1 MW continuous power (high)
- Breakout Session 2 – Key technologies and/or knowledge gaps to get us to envisioned future
 - Same 9 groups
- Breakout Session 3 – Critical factors and themes linking these futures from sessions 1 and 2

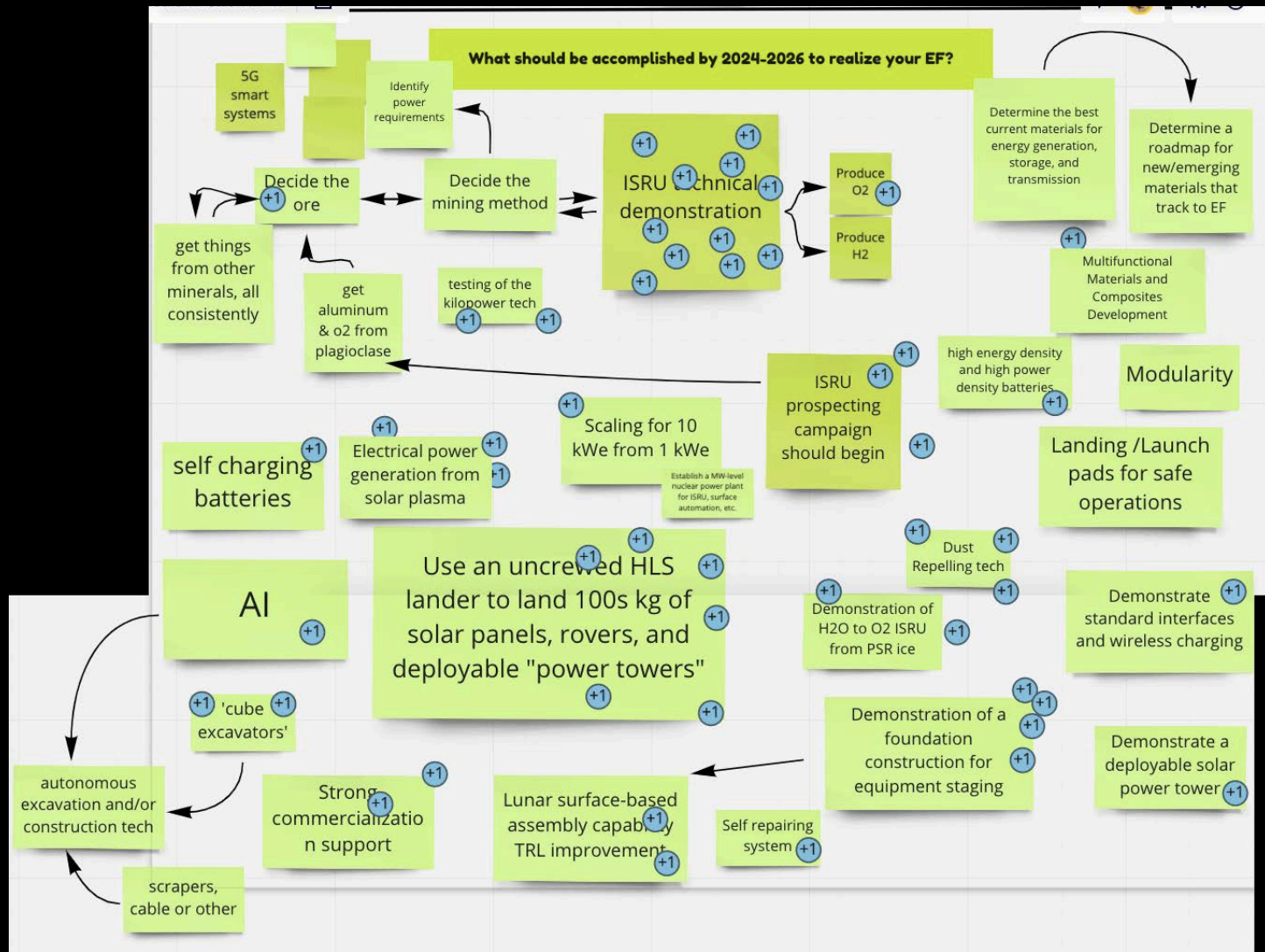


Hour 1 brainstorming
Medium Power 2 room

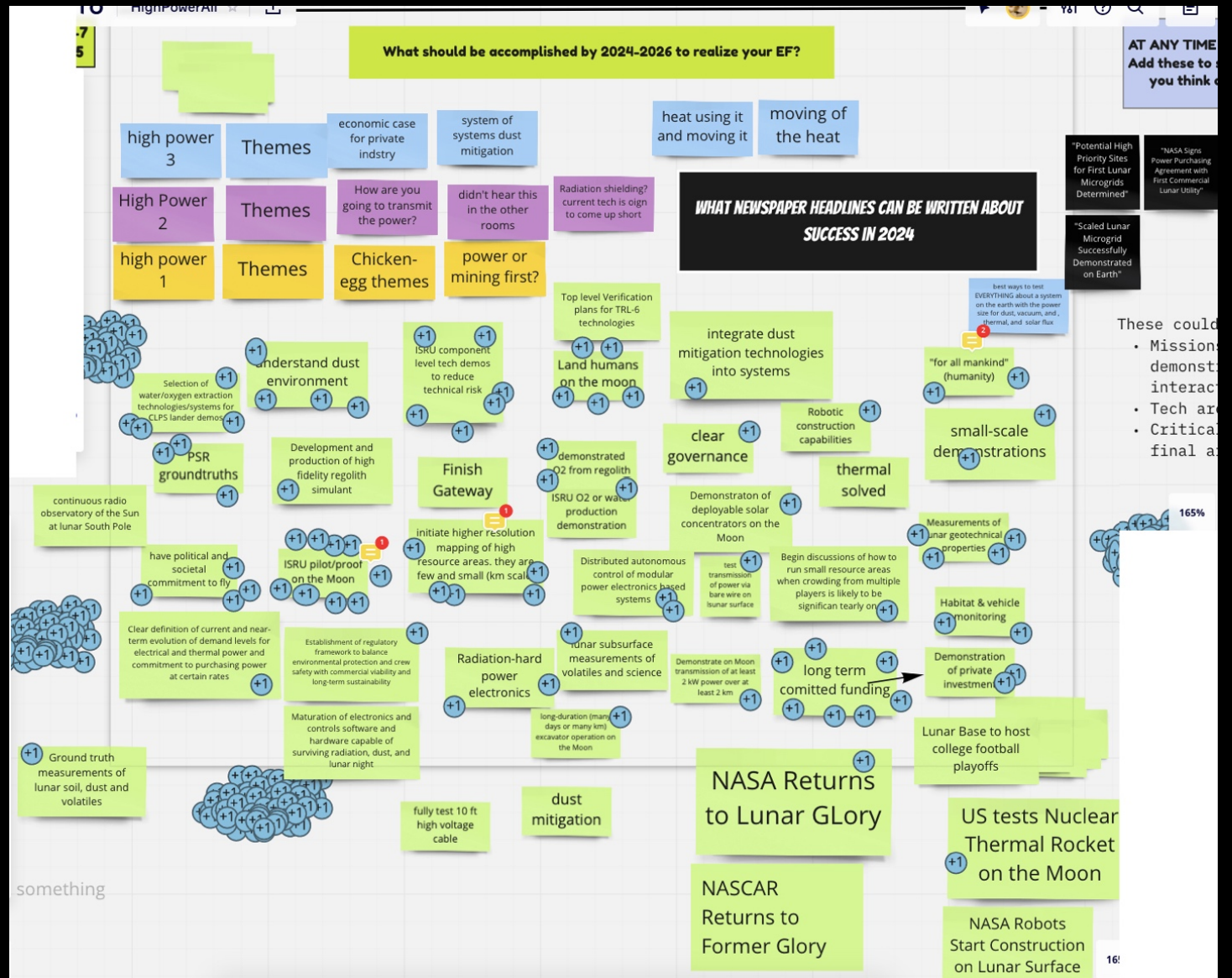
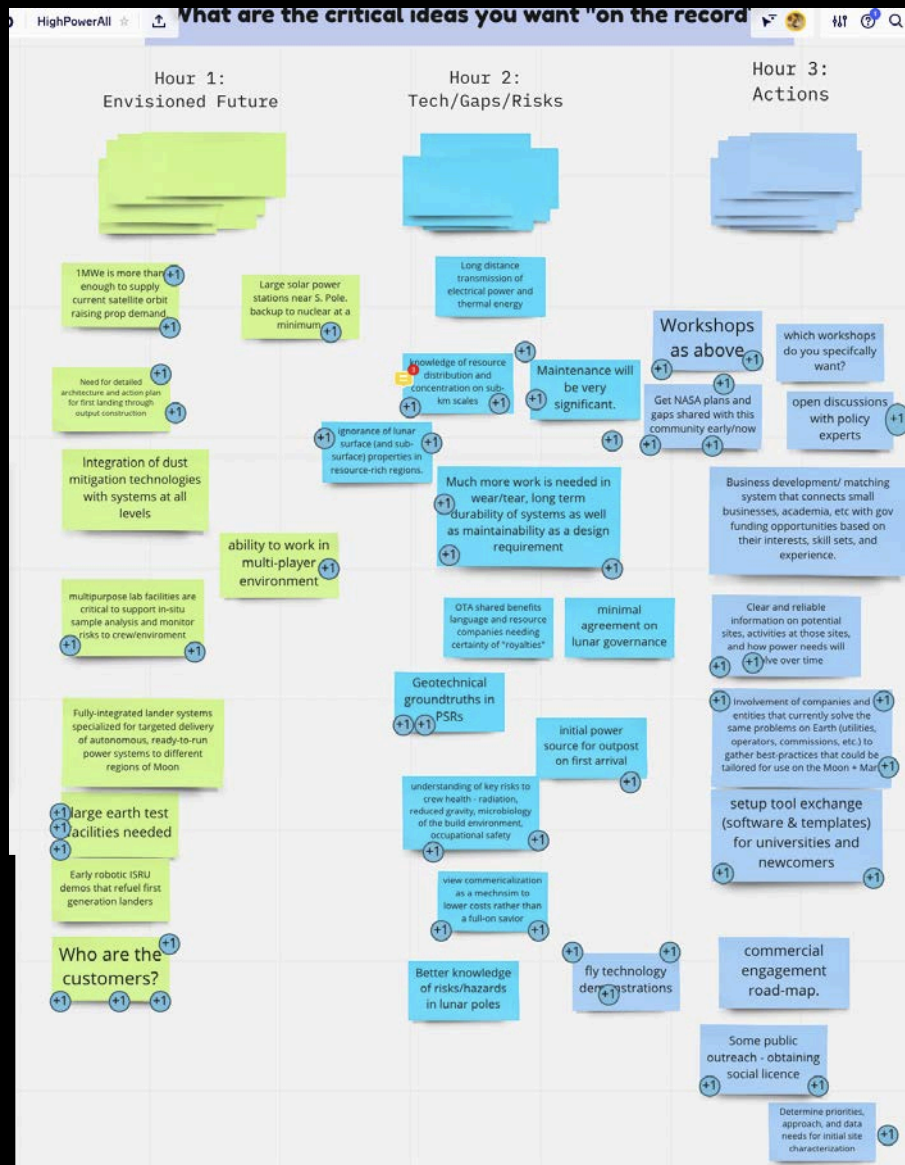




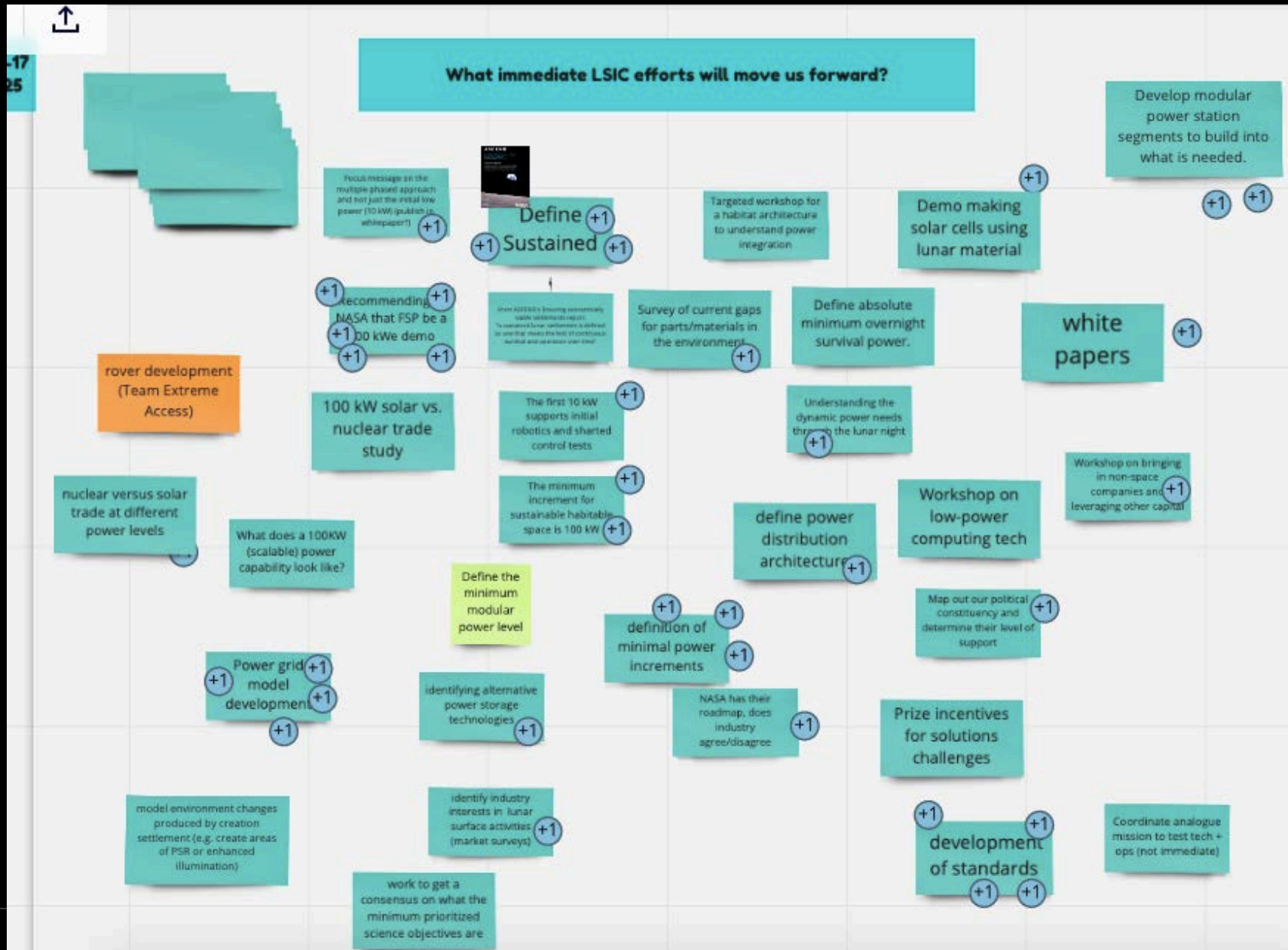
Medium Power



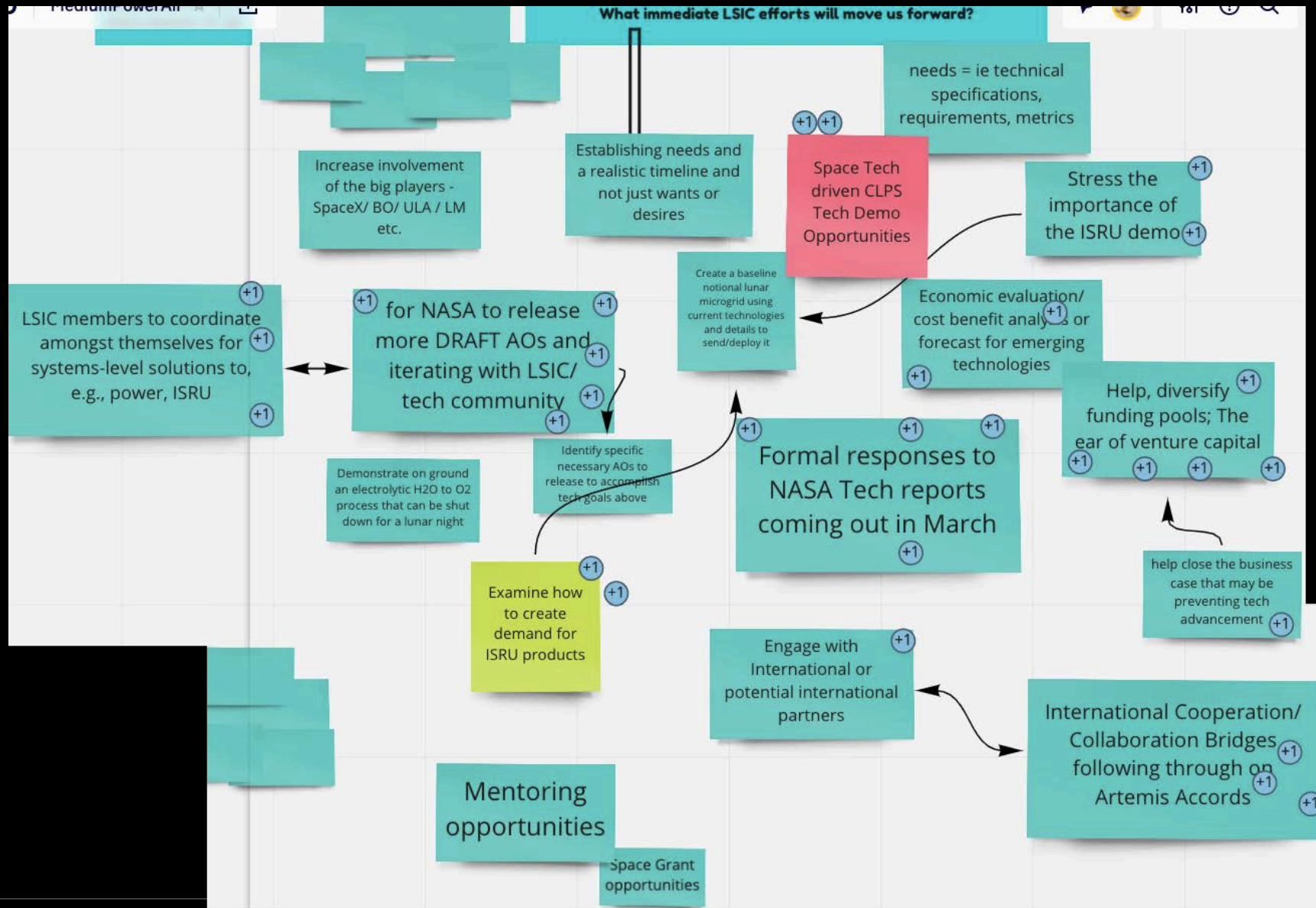
High Power



Low Power – Possible LSIC efforts



Medium Power – Possible LSIC efforts



High Power – Possible LSIC efforts



- Modular/scalable technology and/or power options
- Dust mitigation and wear/tear on systems
 - How to do maintenance?
- ISRU demonstrations
 - Including prospecting and a better understanding of resource distribution and concentration
- Autonomous navigation/operations will be needed at all power levels
 - How long can a base be run autonomously?
- Need for detailed architecture and plans
- International cooperation is very important
- The need for ground-truthing measurements in PSRs and for geotechnical properties
- Sustained funding and policy support are necessary to maintain progress and ensure sustainability

Where to now?

- Looking at different power regimes, where does the EA focus group fit in?
- How should we be interfacing with other groups going forward?
- Can we identify intelligent sequencing so we build up technology infrastructure in efficient ways?
- What are the most important technologies (in terms of EA) that need to be matured and/or disseminated **first**?
- Discuss here and on confluence:
 - <https://lsic-wiki.jhuapl.edu/display/EA/LSIC+Fall+Meeting+Recap+and+Discussion>

Upcoming Meetings

- Focus Group Telecons (2nd Thursday each month, 3-4 pm EDT)
 - [November 12, 2020](#)
 - December 10, 2020
 - January 14, 2021
- ASTM International Conference on Additive Manufacturing, November 16-20
 - <https://mymeetings.astm.org/ereg/newreg.php?eventid=554856&>
- AIAA ASCEND Sustainable Lunar Infrastructure Workshop, November 17 2020
 - <https://ascend2020.ascend.events/event/member/689647>
 - Workshop 14 3-6 pm, November 17 (ET)
- Lunar Surface Science Workshop
 - Foundational Data Products, November 19 2020
 - This workshop will address foundational data products facilitating new scientific research enabled by human exploration of the lunar south pole. The goal of this session is to discuss existing relevant data and to identify key gaps in existing data that could be addressed through precursor missions and/or targeted new observations and analyses.
 - Free, but [registration is required](#)
 - <https://www.hou.usra.edu/meetings/lunarsurface2020/>
- American Geophysical Union Annual Meeting, December 1-17 2020

- Current Funding Opportunities:
 - Vertical Solar Array Technology (due 11/16)
 - <https://nspires.nasaprs.com/external/solicitations/summary/init.do?sollid=%7b68A7EFE3-1B4F-5AA1-A169-119D97C8DB8F%7d&path=open>
 - 2021 BIG IDEA CHALLENGE: Dust Mitigation Technologies for Lunar Applications (due 12/13)
 - <http://bigidea.nianet.org/2021-challenge/>

Talk from Lunar Outpost



JOHNS HOPKINS
APPLIED PHYSICS LABORATORY

Contact information

LSIC Director: Rachel Klima, SES-LSIC-Director@jhuapl.edu
<http://lsic.jhuapl.edu>

Focus Group Area	Listserv address	Facilitator
In-Situ Resource Utilization	LSIC_ISRU@listserv.jhuapl.edu	Karl Hibbitts
Surface Power	LSIC_Power@listserv.jhuapl.edu	Wes Fuhrman
Extreme Environments	LSIC_ExtremeEnvironment@listserv.jhuapl.edu	Ben Greenhagen
Extreme Access	LSIC_ExtremeAccess@listserv.jhuapl.edu	Angela Stickle
Excavation and Construction	LSIC_ExcavationConstruction@listserv.jhuapl.edu	Athonu Chatterjee
Dust Mitigation	LSIC_DustMitigation@listserv.jhuapl.edu	Jorge Núñez

STMD Opportunities for Academia and Industry

STMD anticipates awarding ~\$600M to academia and industry supporting 2020 solicitations & awards

STMD Tipping Point Multiple Awards: *Jan – Mar 2020*

\$250M

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Phases I, II, II-E, Civilian Commercialization Readiness Pilot Program (CCRPP), Sequential: *Phase I Solicitation Jan – Apr 2020*

\$212M

Announcement of Collaborative Opportunity (ACO): *Jan – Mar 2020*

\$10M

Flight Opportunities Tech Flights: *Feb – May 2020*

\$10M

Early Career Faculty (ECF): *Feb – Apr 2020*

\$6M

Early Stage Innovations (ESI): *Apr – Jun 2020*

\$9M

NASA Innovative Advanced Concepts (NIAC) Phases I, II, III: *Phase I Solicitation Jun – Jul 2020*

\$4M

Space Technology Research Institutes (STRI): *Jun – Aug 2020*

\$30M

NASA Space Technology Graduate Research Opportunities (NSTGRO): *Sep – Nov 2020*

\$19M

SmallSat Technology Partnerships (STP): *Sep – Nov 2021*

\$3M

Centennial Challenges: *Varied release dates*

\$8M

NextSTEP Broad Agency Announcements (BAAs): *Varied release dates*

Varies

Lunar Surface Technology Research (LuSTR) Opportunities: *Coming soon!!!*

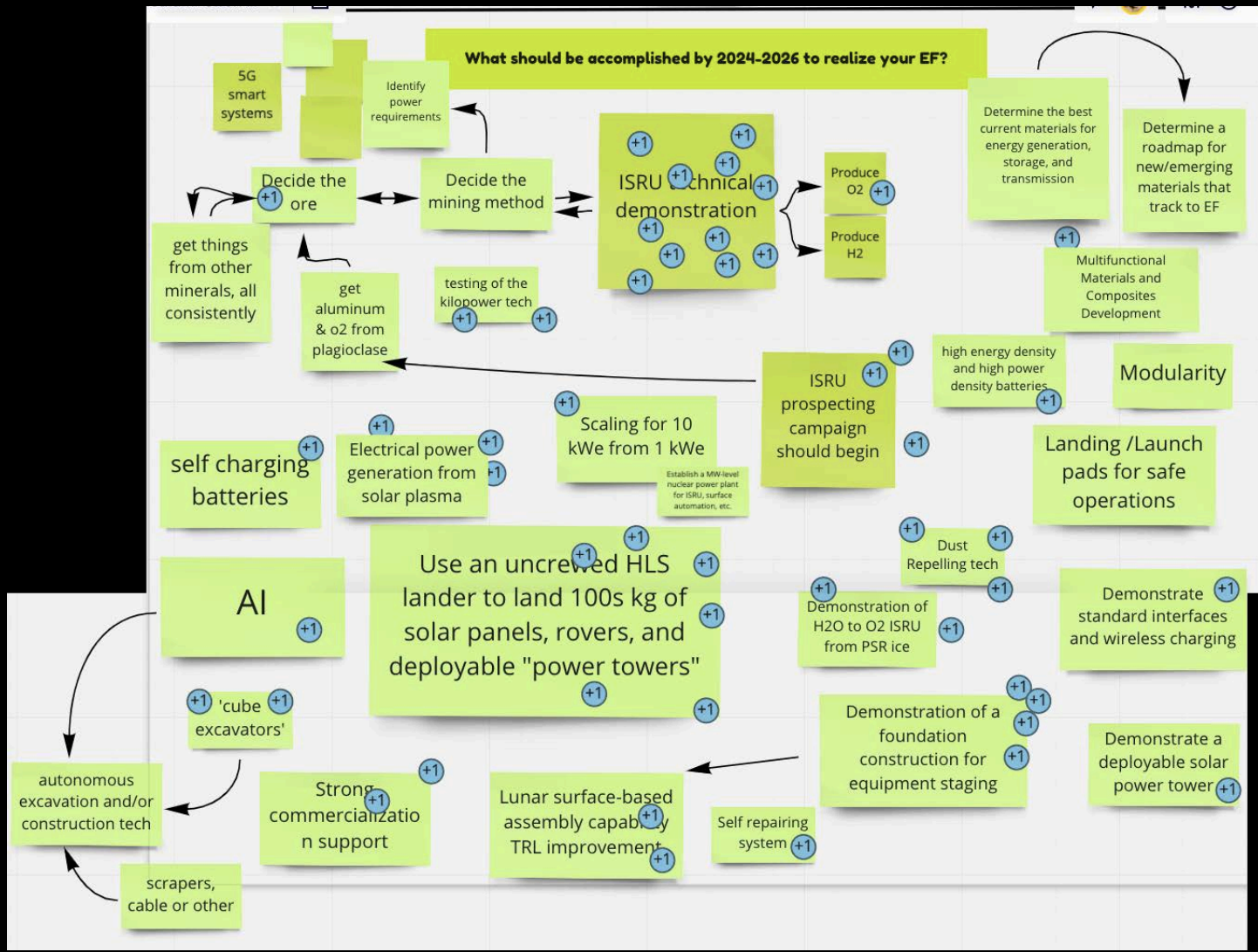
\$30M

Note: Funding awards are approximate and subject to change

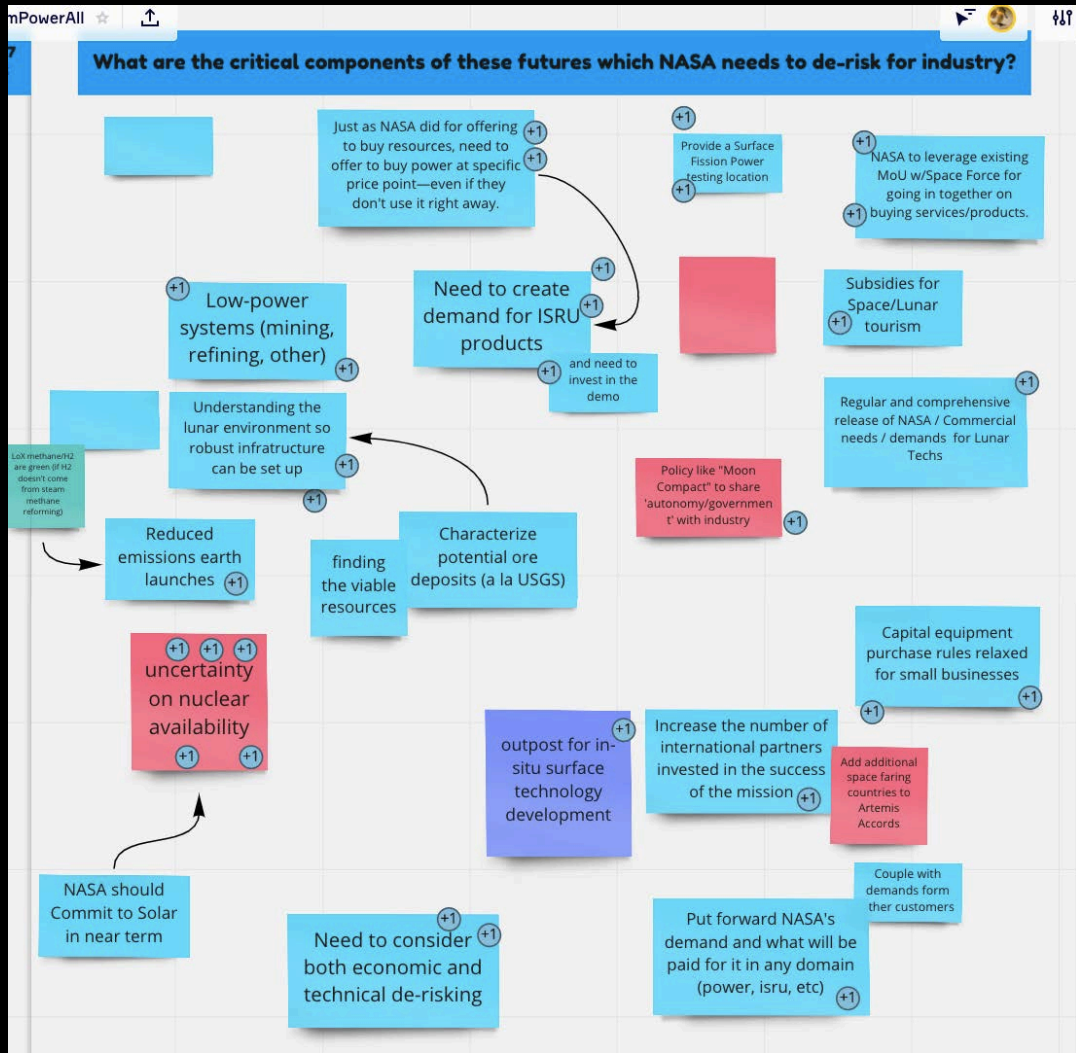
Open Solicitations as of June 5, 2020

Solicitations were/will be open in the timeframe specified in italics

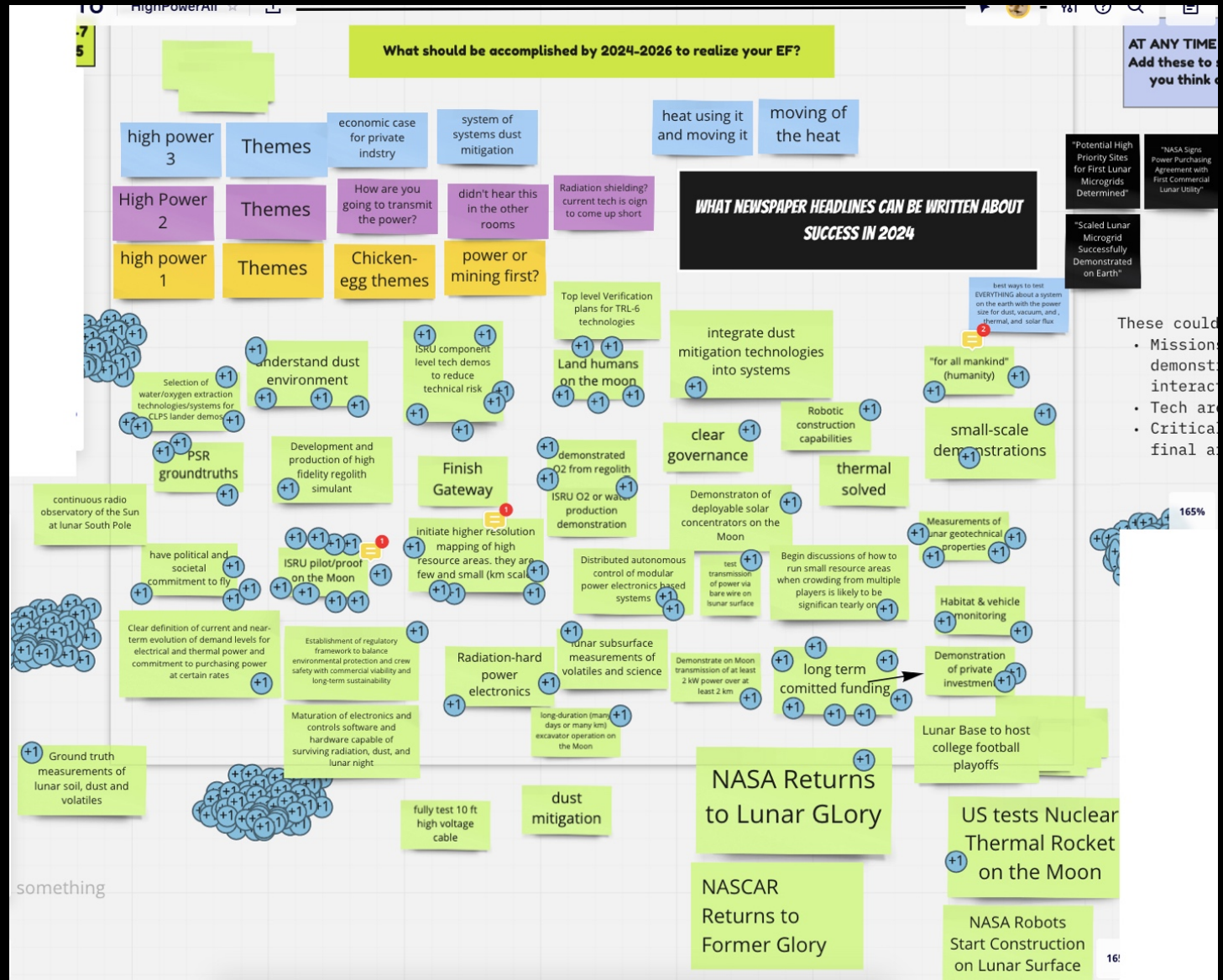
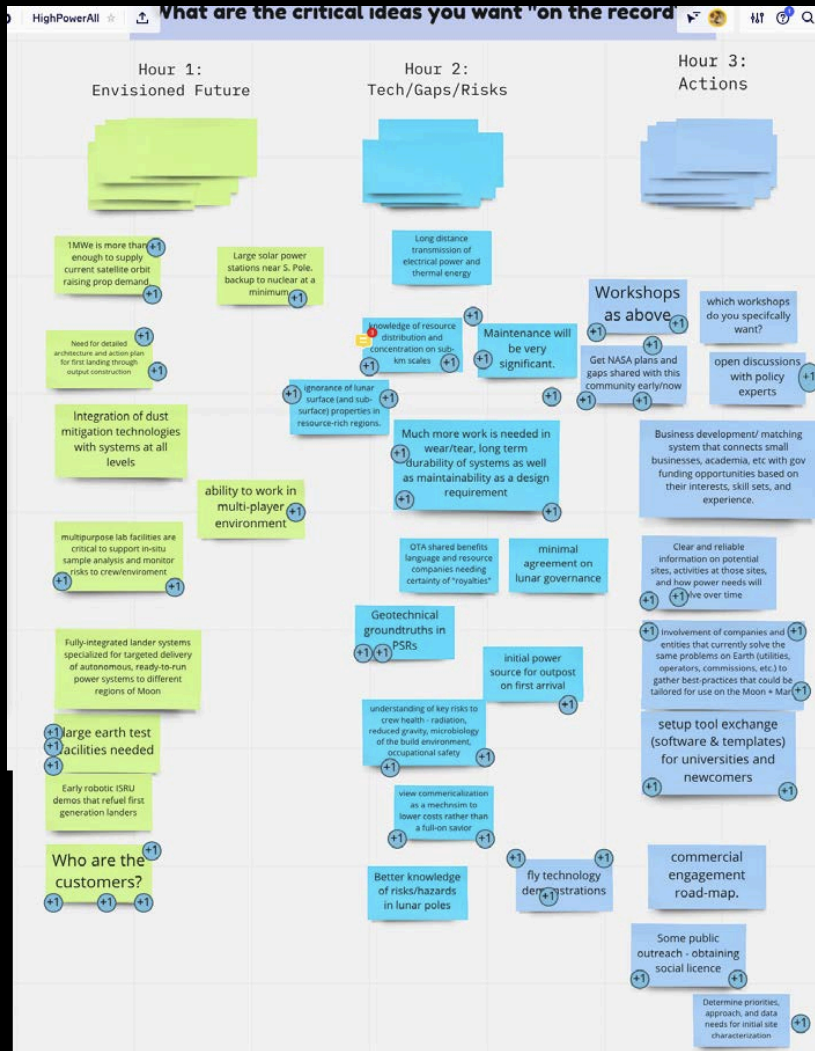
Medium Power



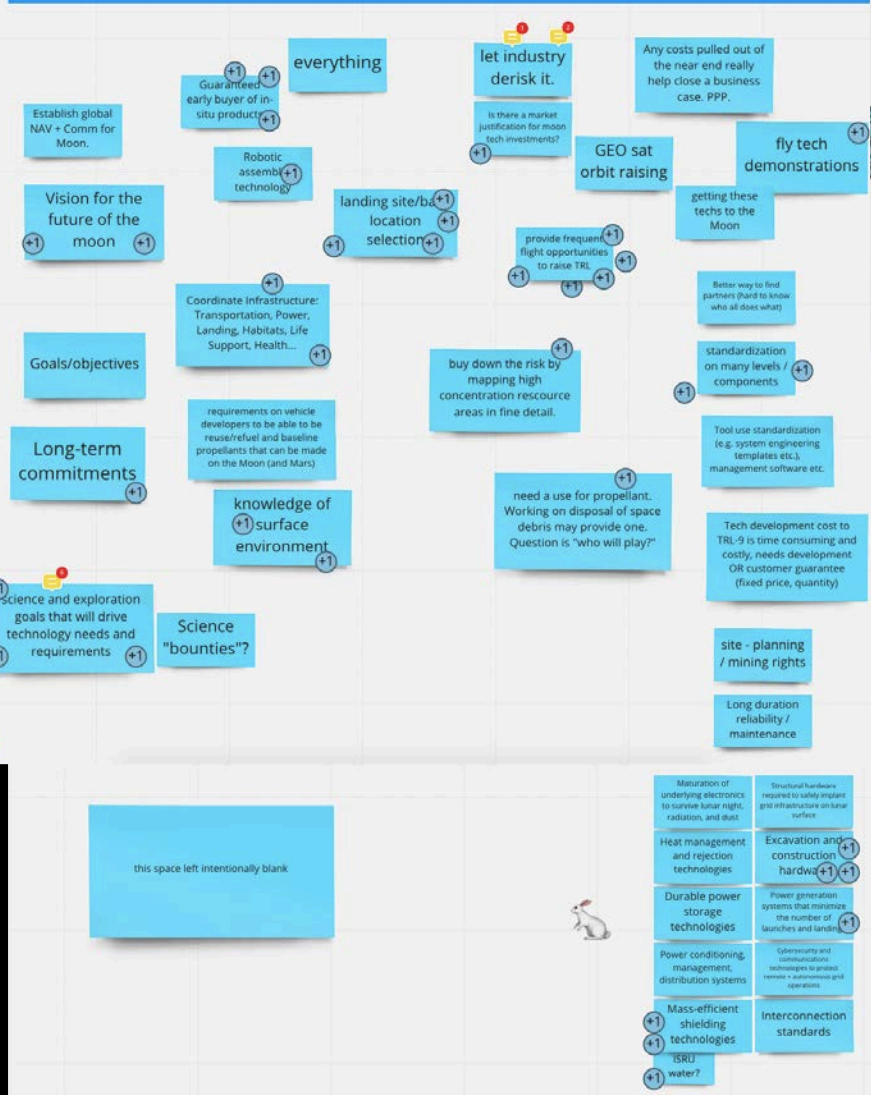
Medium Power



High Power



What are the critical components of these futures which NASA needs to de-risk for industry?



What did we miss? What are our tacit assumptions?

