ZPE Device Technology Development Process Overview

Gated phase process reduces time & cost, and maximizes the probability of success

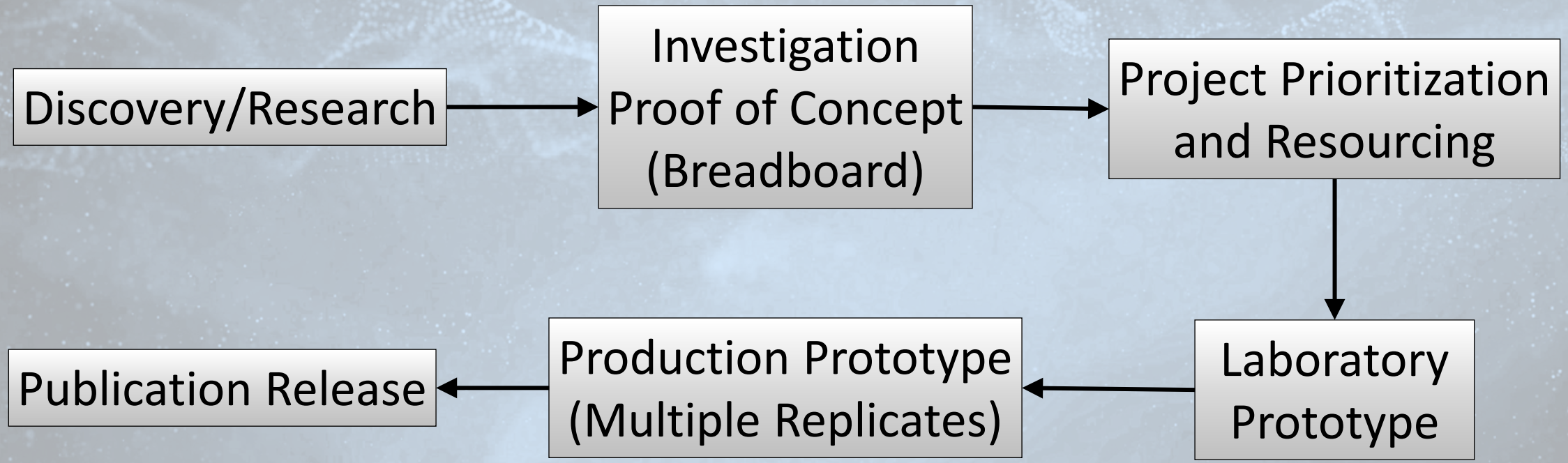
Purpose of Presentation

- To provide a framework for the basic workflow and oversight for the effective and timely development of novel energy technology by a distributed, collaborative team of volunteers
- Used as a basis for project management, helps minimize time & money and maximizes probability of attaining specified goals
- To adapt best practices of new technology development common in industry and governments to a distributed volunteer paradigm
- To provide a basis for discussion and continuous process improvement throughout technology development and promulgation

Gated phase product development

- Provides a clear framework within which technologies are innovated, demonstrated, developed and promulgated
- Helps to clarify roles, responsibilities, milestones, requirements …
- Ensures realistic timelines, deliverables, owners, resource requirements, and risks
- Uncovers weaknesses early so they can be addressed
- Improves interactions and expectations with all stakeholders
- Provides context by which informed and consistent decisions can be made on funding and support at each stage of development

New Technology Development, Documentation and Publication Stage/Gate Example



Discovery/Research Phase

This is where one determines if the proposed technology has enough credible evidence that it might work, satisfy requirements, and thereby warrant the Group to spend time, money and effort on it.

Clearly the stage we find ourselves in at the start of 2024. All publicly disclosed zero-point energy device designs:

- Are not credibly vetted
- Omit details critical for successful implementation

Note: If credible technology can be acquired that meets the exit criteria of this stage, the stage can be skipped, significantly accelerating our timeline and probability of success.

Discovery/Research Phase Attributes

- Invention, proposal of underlying theories of operation
  - May be accelerated through implementation of artificial intelligence tools
- Initial proof of concept
- Basic breadboards are built and demonstrate functionality
- Just-enough Software/Firmware
- Documentation of designs and testing protocols and results
  - sufficient documentation to allow others to replicate and verify results independently
- First-pass comparison to existing and competitive new technologies
- Explicit experiments and test results that support functionality

Typical Risks Related to Device Designs from Independent Inventors

- Not proficient at build-test-improve process, stagnation, stuck in repeating failures
- Not skilled at setting and measuring critical performance metrics
- Self delusion (ignores failures, critical limitations, stuck on improving obviously non-functional design or concept)
- Ego (creates possessiveness, rejection of advice, exaggeration of facts, ignorance)
- Unskilled or disinterested in documentation (incomplete, incorrect and/or out of date documentation)
- Unrealistic expectations (my stuff is worth billions, it is just great the way it is, I can do it myself)
- Unfocused/scattered (all over the place, not good at planning and execution, completely changes direction before completing)

General Discover/Research Phase Risks

- No, or incorrect performance objectives
- Improper test design and execution (experiments, criteria, data analysis)
- Deception, misreporting, exaggerating results
- Insufficient resources (people, money, tools)
- Insufficient skill set(s)
- Active interference (suppression)

Discovery/Research Phase Exit Criteria

- Something tangible (preliminary results) with credible evidence of the potential of the device/technology working
- Grasp of basic concepts of its functionality, theory of operation and a manageable path forward for improvements
- Firm plan for next-phase (breadboard assembly and testing)
  - Breadboard design including parts list, physical parameters
  - Required resources (funding, test devices, personel, workspace, etc.)
  - Timeline
  - Realistic plan for build – test – modify – test

Investigation/Feasibility Stage

(Very difficult stage for independent researchers/innovators to complete on their own)

1. Next-level proof of concept, but still in form of breadboards
   a. Ostensibly more than one, more people collaborating on various aspects, solving problems, modifying, testing, improving
   b. Selection between, development, and test of alternative approaches and implementations
2. Testing versus requirements
3. More structure, more realistic, increasing internal and external confidence
4. Credible proof of concept to knowledgeable external reviewers
5. Refinement of related concepts (underlying theory, practical aspects, speculation on paths to future improvements)

Investigation/Feasibility Phase (cont'd)

6. First pass definition of Features, Usability, Reliability, Performance, Supportability (FURPS) for use in Device Requirements
7. Development of initial External Reference Specification (ERS) – Device centric
8. Verification of potential of device to meet basic SRS and ERS requirements
9. Identification of key customers/leaders, early adopters, potential technology champions
10. Identification of potential collaborators and tools for interaction on further development/implementation
11. Documentation and communication of verified results and technology specifics

Investigation Phase Exit Deliverables

1. Credible expectation that the product can meet requirements “musts”
2. Consensus that the underlying technology is understood “enough” and that no further significant invention is needed going forward
3. Credible expectation that the proposed device is manufacturable (based on stated knowns and assumptions)
4. Realistic plan in place for Prototype Phase including documentation, resource needs defined, realistic timeline, deliverables, owners, risk management plan, communication plan, etc.
5. Documentation of sufficient quality for others to understand and repeat what was done

Project Prioritization

Reflects reality of limited resources and time

Prioritize potential technologies of merit based on:

- Confidence in technology/approach meeting requirements
- Assessment of available related theory and device documentation
- Estimated resource and time requirements for lab prototype phase
- Ability to resource lab prototype phase (people, funding, facilities, skills, etc.)

Laboratory Prototype Phase

Stage where at least one unit is built and tested in an informed, collaborative environment to validate if it can meet requirements.

- Build prototype unit and test relative to requirements
- More structured, more formal than breadboard, considers manufacturability, safety, component specifications, quality factors
- Develop and refine/iterate design based on results (design-test-improve cycle)
- Establish working understanding of functionality and variables involved
- Define/refine requirements related to external implementation of technology

Lab Prototype Exit Deliverables

- Basic design for device that satisfies requirements
- Complete documentation
  - All parts specifications
  - Mechanical design and specifications
  - Relevant learning, emperical theory
  - Applied tests and results, interpretation of results
  - Ideas for further improvements, etc.
- Formal comparison to competing technologies
- Credible plan for Production Prototype Phase

Production Prototype Phase

Implementation of proposed device design in more diversified environment including several replicate units and more diverse participation.

- Answer the question: “does it work?” Then prove it.
- Refine design, implementation of components and assemblies (electronics, physical components, firmware, etc.)
- Significant participation from all stakeholders to confirm satisfactory accomplishment of all required attributes.
- Document all processes and results that demonstrate device functionality as well as device design including build instructions

Production Prototype Phase

- Assess quality factors such as reliability, repeatability, safety, ruggedness, usability, etc.
- Refine SW, FW, electronic and electrical components
- Expand outside exposure and get feedback in controlled confidential manner

Production Prototype Phase Exit Criteria

- Confirmation that the device meets all requirements
- Complete documentation
- Credible publication/promulgation/publicity plan

Publication/Release

- Tell the story using multi prong communication approach
- Be responsive and helpful in role of domain expert
- Team of technology champions actively promoting and teaching
- Provide centralized and consistent means of responding to requests for information
- Provide technical support for those seeking to implement
- Collaborate with those active in improvements
- Cooperate with those interested in commercializing
- Regularly update and communicate materials as more is learned