

Institute of Design – IIT
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EXTREME HEAT OCCUPATIONAL HAZARDS AND SOCIAL PRESSURE

Making Heat Adaptation Work for Workers

Agenda

01

The problem space

02

Who are we serving: Population of focus

03

Behavioral Issues Addressed: Policy Implications

04

Activity Approach

05

Expected Outcomes

The problem space

100% of fatal cases and 73% of non-fatal cases exceeded recommended heat stress limits, indicating current worker guidelines may be inadequate.

Evaluation of Occupational Exposure Limits for Heat Stress in Outdoor Workers — United States, 2011–2016

(environmental heat + metabolic heat)

wet bulb globe temperature [WBGT]
air temperature, relative humidity, wind speed, and radiation

workload

×

unacclimatized to heat
workwear clothing that inhibits heat dissipation
predisposing personal risk factors

Tustin, A. W., Lamson, G. E., Jacklitsch, B. L., Thomas, R. J., Arbury, S. B., Cannon, D. L., Gonzales, R. G., & Hodgson, M. J. (2018). Evaluation of Occupational Exposure Limits for Heat Stress in Outdoor Workers - United States, 2011-2016. MMWR. Morbidity and mortality weekly report, 67(26), 733–737. <https://doi.org/10.15585/mmwr.mm6726a1>

Uniquely compelling tensions

Economic Growth vs. Sustainability

Balancing short-term costs with long-term environmental benefits.

Artificial interventions vs. natural preservation efforts.

Individual Comfort vs. Collective Resilience

Personal AC use vs. strain on grid infrastructure.

Immediate relief vs. sustainable, long-term solutions.

Local Autonomy vs. National Coordination

Defining responsibilities between local action and broader, coordinated efforts.

Rapid Implementation vs. Community Engagement

Fast deployment of solutions vs. inclusive, co-designed approaches.

Risk of leaving vulnerable groups behind.

Risk Communication: Awareness vs. Fatigue

Keeping people alert without causing desensitization.

Consistent, clear messaging across all levels of authority.

Action vs. Inaction

Mitigating compounding risks from delayed responses.

Navigating political and economic pressures in decision-making.

The Population



Frontline / Emergency workers

Autonomy: Little to none, mandatory presence during crises

Institutional Support: Strong; backed by organizational mandates, obligated by institutional duty

Risks: High, due to direct exposure and high-pressure scenarios



Blue and white collar workers

Autonomy: Some, depending on policies and orders

Institutional Support: Moderate; bound by labor laws and company policies

Risks: High, subject to safety protocols but still vulnerable to hazards



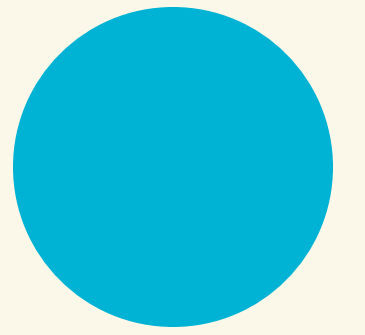
Gig workers/ independent contractors

Autonomy: High, though heavily influenced by financial and social pressures

Institutional Support: Low; operate outside formal institutional frameworks

Risks: High, lack of formal safety nets and support mechanisms

Policy Considerations



Target Audience

Engage diverse stakeholders, and agents within the system including:

Primary: Policy makers and government officials

Secondary: Community organizations and stakeholders involved in implementing heat-related policies

Tertiary: Urban planners, public health officials, and emergency response teams

Present Bias

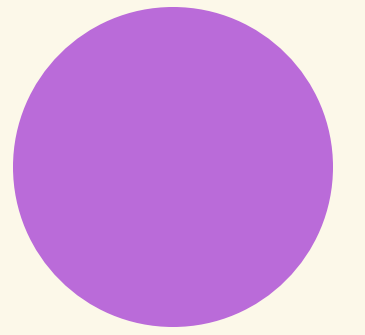
How might policy makers understand how **policy interventions must balance immediate incentives with long-term benefits** while addressing both short-term preparedness and comprehensive risk mitigation strategies.

Loss Aversion

Frame scenarios that leverage people's natural tendency to avoid losses, **motivating concrete actions to reduce heat risks.**

Move beyond education to prevention by **using loss aversion as a driver for behavioral change**

Behavioral Economics Considerations



Decision Making

Decision-making is deeply rooted in context.

People's choices are heavily influenced by their immediate environment and circumstances—particularly for workers and employees. What financial pressures constrain their focus during extreme heat?

What financial pressures constrain their focus during extreme heat?

Leaning into Trade-Offs

Understand the trade-offs to design **more effective policies** that **acknowledge real-world constraints** and competing priorities.

People often face **competing priorities and must balance multiple factors** when making decisions.

How do these factors emerge in the characters?

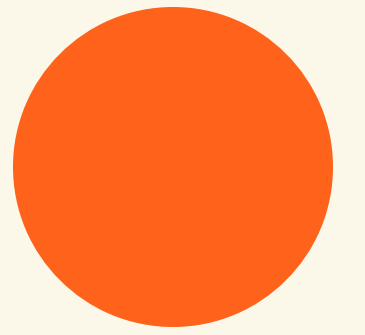
Revealing Power Asymmetry

Power imbalances **influence decision-making dynamics** between different stakeholders.

Show how **those with more power often have greater access to resources**, information, and decision-making authority. **To design interventions that protect vulnerable stakeholders.**

How power dynamics in extreme heat reveal market inequalities?

Behavioral Design Choices



Intrinsic Motivation

Drive the audience to **engage in the scenarios due to the inherent interesting, engaging, challenging, or enjoyable**, rather than for external rewards.

Create more sustainable behavioral changes by **connecting with the audience inherent interests**, values and internal motivations.

Extrinsic Motivation

Rewards and incentives that drive behavior change, “financial rewards or penalties and recognition and social status”.

Designed to gradually transition to more sustainable internal drivers. Help make the clear **connection between desired behaviors and rewards**.

Scenario Testing

Simulations that allow the audience to **explore potential scenarios and their outcomes**.

Evaluate different situations and better understand how the public might respond to specific policy interventions.

Validate policy assumptions and identify potential implementation challenges.

Distinct Values Interplay

Strength

- Creates accountability and standardization across different stakeholders
- Enables legal and regulatory enforcement when needed

Weakness

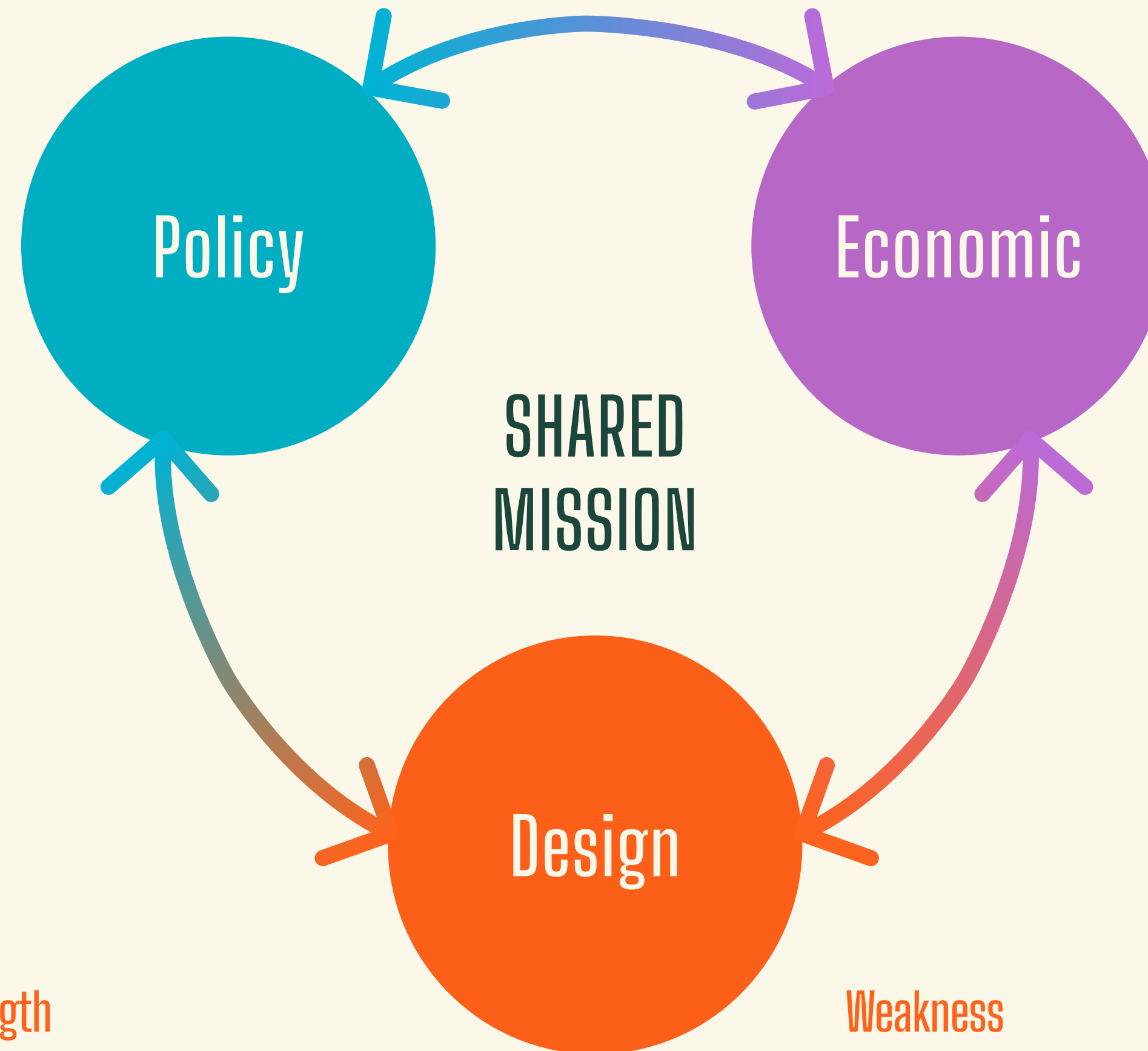
- Might create unintended consequences
- Can be disconnected from ground-level realities

Strength

- Humanity centered approach that prioritizes user needs and experiences
- Visual and experiential objects to make complex concepts more accessible

Weakness

- Can be resource-intensive and time-consuming
- May lack reputation acceptance or credibility in traditional circles



Strength

- Provides insights into actual human decision-making patterns
- Helps identify and address cognitive biases affecting policy outcomes

Weakness

- Effectiveness may vary across different populations
- Can oversimplify complex social and cultural factors



Addressing the challenge through game

elements and mechanics



What it is

Core Game Concept

A narrative-driven role-playing simulation that exposes power asymmetries in occupational heat response, where players navigate the tension between individual survival and collective resilience in an increasingly pressured system.

Format:

Asymmetric conversational game with policy-informed scenarios

Duration: 90-120 minutes

Players: 2-6 players

Key Interaction and Game flow

A

Assign

Introduce the environment, scenario, and assign roles

D

Device

Allocate resources and make strategic decisions

A

Act

Interact with stakeholders and negotiate outcomes

P

Process

Reveal and process consequences collaboratively

T

Transform

Takeaways and reflection

Key Elements

How game components work together to drive behavioral learning and system understanding



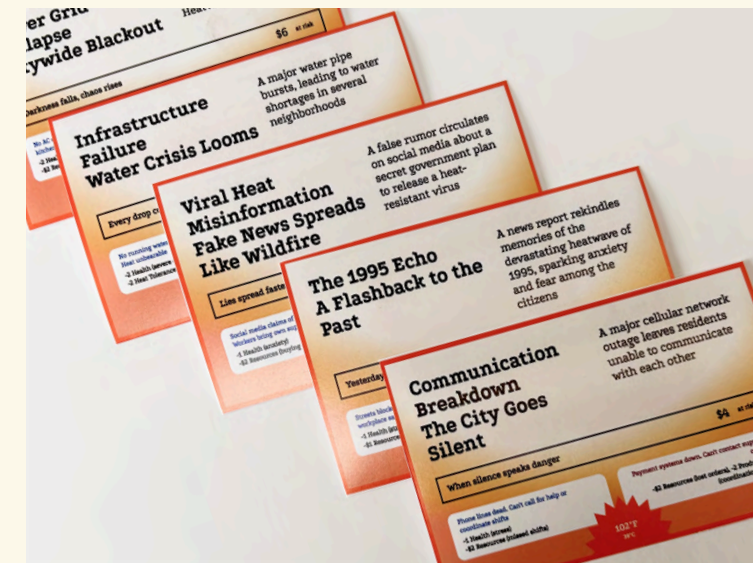
Play Board

Economic Interface

Tracks resource allocation and market dynamics.

Visualizes power asymmetries and trade-offs.

Highlights systemic impacts of individual decisions.



Scenario Pack

Context-Rich Case

Presents real-world challenges with escalating heat risk scenarios.

Simulates system stress through compounded pressures and vulnerabilities.

Requires navigating constrained resources and difficult trade-offs.



Character and Action Cards

Embodiment of hidden Priority

Fames decisions with clear costs and benefits.

Balances immediate vs long-term tradeoffs.

Models risk-taking and loss aversion under pressure.



Resources

Value exchange mechanisms

Enables transactions, sharing, and strategic allocation.

Highlights scarcity, surplus, and uneven distribution.



Reflection

Learning prompt

Collective experience sharing

Cross-stakeholder perspective building

Common language development

Behavioral bias identification

Takeaways

01

New perspectives on heat resilience

Explore how power dynamics, social norms, and institutional factors shape responses

Uncover behavioral biases that underestimate risks or resist protective measures

Highlight how resource scarcity disproportionately impacts vulnerable populations

02

Understanding of system dynamics

Illustrate complex feedback loops and unintended consequences

Reveal how stakeholder actions interact to influence overall outcomes

Demonstrate how information gaps prevent grasping system-level impacts

03

Appreciation for proactive approaches

Showcase early, coordinated interventions that build long-term resilience

Highlight behavioral strategies (social norming, feedback, defaults) to empower action

Illustrate designing systems/policies that make resilient behaviors easy

(Un)expected Outcomes / Surprise and Learning

Character Embodiment

Depth of backstories and how they shaped character motivations

Assumptions challenged by gradual reveal of hidden attributes

Reactance and Response in Conducive Environment

Tensions between stated policies and incentivized actions

Experimental mindset enabled by interactive, narrative-driven format

The Power of Reflection

No one has a complete view of the system

Limitations of individual perspectives, need for diverse viewpoints

Surfacing implicit biases and challenging assumptions

Harnessing the power of real-world behavior insights for policy

When there's no turning back, a proactive approach is critical to develop more equitable, sustainable, and effective policies

THANK YOU!

“Policy is not just about what governments do;
it's about how people respond to what governments do”

— Cass Sunstein