EMERGENT FUTURES: EXPLORING ENERGY TRANSITION CHOICES THROUGH SERIOUS GAMES

CONTEXT

Cumulative Impacts Development

Mitigation/ Adaptation Paris 2015 COP 29

Sendai Framework Disaster Risk Reduction

resilience

Energy Transition

UN Sustainable Development Goals
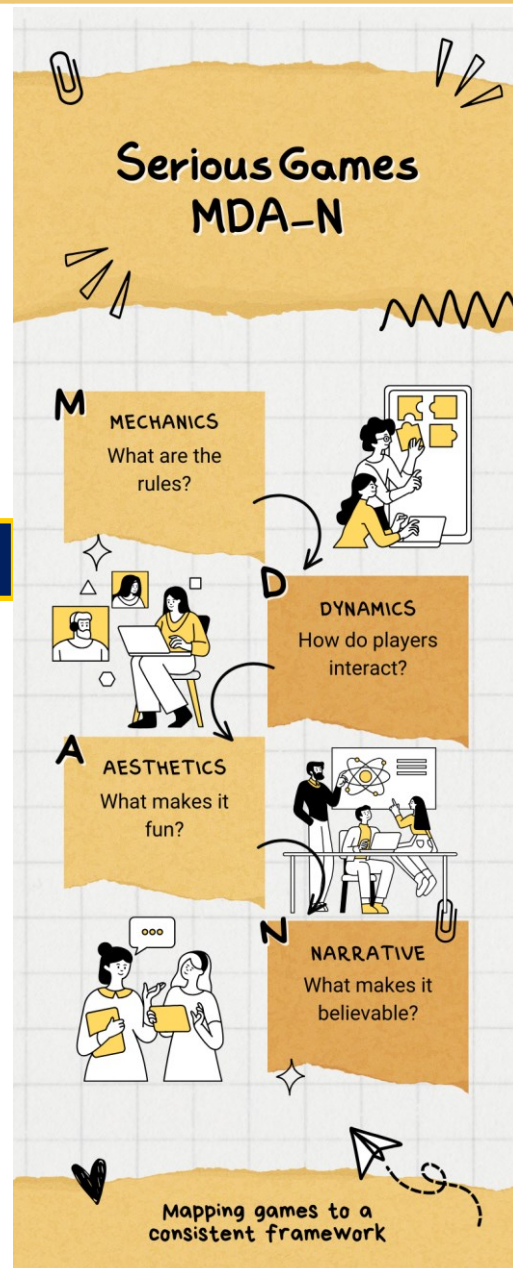
Cumulative Impacts Climate Change
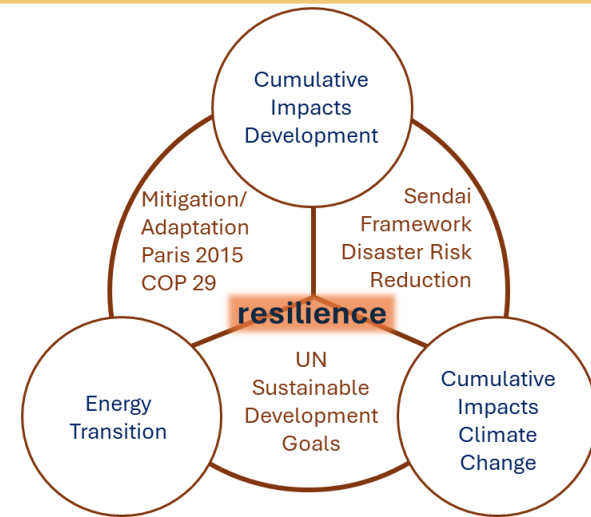
RESEARCH QUESTIONS

How can foresight science be integrated into serious game design and development to support participatory planning that considers the cumulative impacts related to an energy transition?

How are serious games in this space framed e.g. tool, innovation, persuasion or self organization, and what game design elements support this framing?

What cognitive models are used e.g. information deficit, procedural rhetoric, or emergent dialogue, and how does that relate to the narrative fidelity (believability).

FRAMEWORK

Serious Games MDA–N

M MECHANICS — What are the rules?

D DYNAMICS — How do players interact?

A AESTHETICS — What makes it fun?

N NARRATIVE — What makes it believable?

Mapping games to a consistent framework

CASE STUDIES

Foresight Steps	Maladaptation	Sim4Nexus	MSP Challenge 2050
Scope	• Farmers, researchers • Nordic communities	• Policy planners (Federal & local) • Europe	• Marine planners, ecologists, developers • Sea Basins (Baltic, North)
Gather Inputs	• Agricultural model data, regionalized climate model data	• Federal, local policy data by nexus category	• Information Models: Ecosim, Ecopath, logistics models, • Policy data (EU, country)
Trend impact analysis	• Place based, linked model of climate change hazards and adaptation to crops	• Place based scientific models with 9,000 inter-related variables	• Place based Ecosim and Ecopath models using 5,000 layers of data for cumulative impact analysis
Scenario Planning	• Four pre-set challenges tied to climate hazards with uncertainty factor	• Water\Land\Energy\Food Nexus policy • Uncertainty from feedback loops in a climate context	• Not preset, player\planner proposes energy development project and interacts with integrated model – high uncertainty
Storylining	• Timeline: A season • Adaptation choices, randomized, preset possible outcomes • Simplified comic style • No feedback loops	• Timeline: to 2050 • Policy choices in five-year sets • Visual indicators: Policy Dashboard, Nexus Health Indicators, variable connections	• Timeline: to 2050 • Geographic view before/after project within the sea basin • Visual indicators: social and ecological metrics impacted by development plan. Visual presentation of stressor and pressure feedback loops
Adaptive management	• Assesses learning outcomes through iterative gameplay	• Co-development through iterations, applies learning to next iteration	• Evaluates and progresses through iterative co-development • Community wiki