Poseidon Consulting

Novel technology and conservation project for Southern California

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Topic

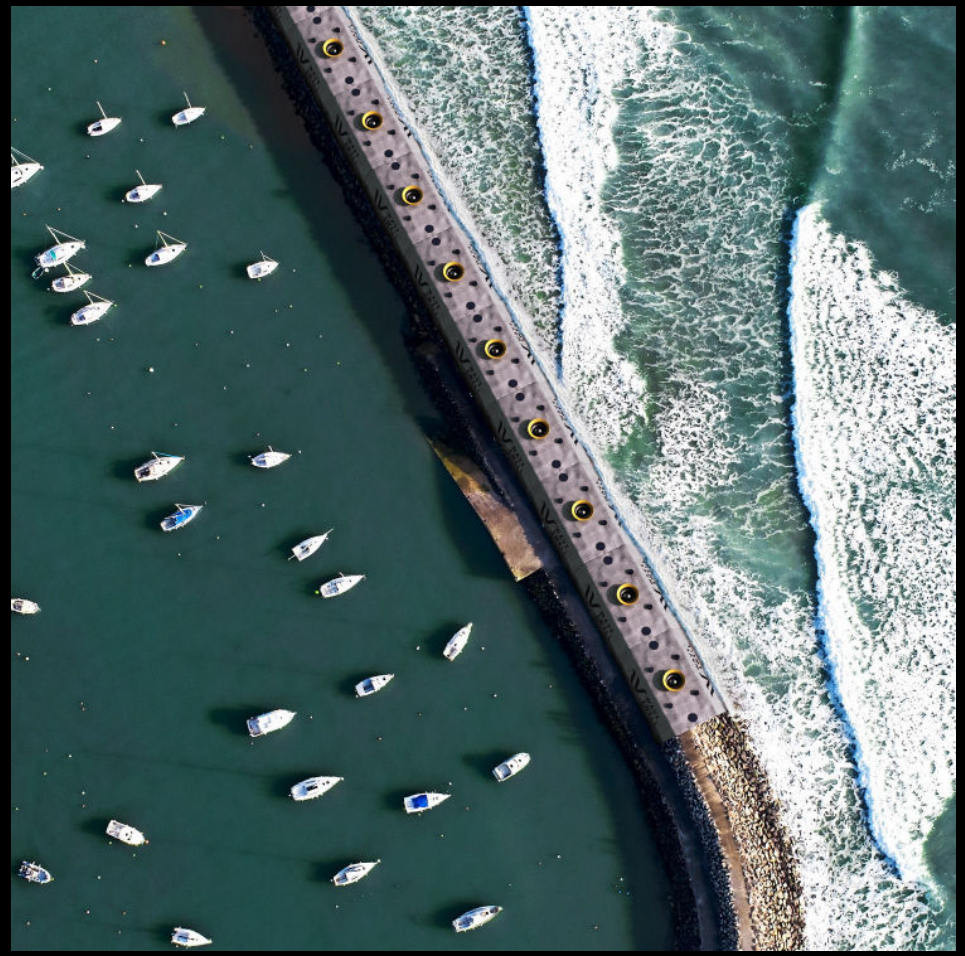
As a result of climate change and overexploitation, coastal erosion has become an issue around the world. We narrowed it down to California, as we have seen this problem quickly escalate there.

With climate change comes extreme weather patterns such as powerful storms and flooding, as well as severe droughts. These drastic and quick changes cause instability in the cliffs, increasing the rate of erosion.

Overexploitation, such as development and poaching is another issue causing erosion.

As fossil fuel energy production is a leading cause for climate change, we want to create a clean energy source that gives back to the environment.

Novel Wave Power Technology



WSE Uniwave 200

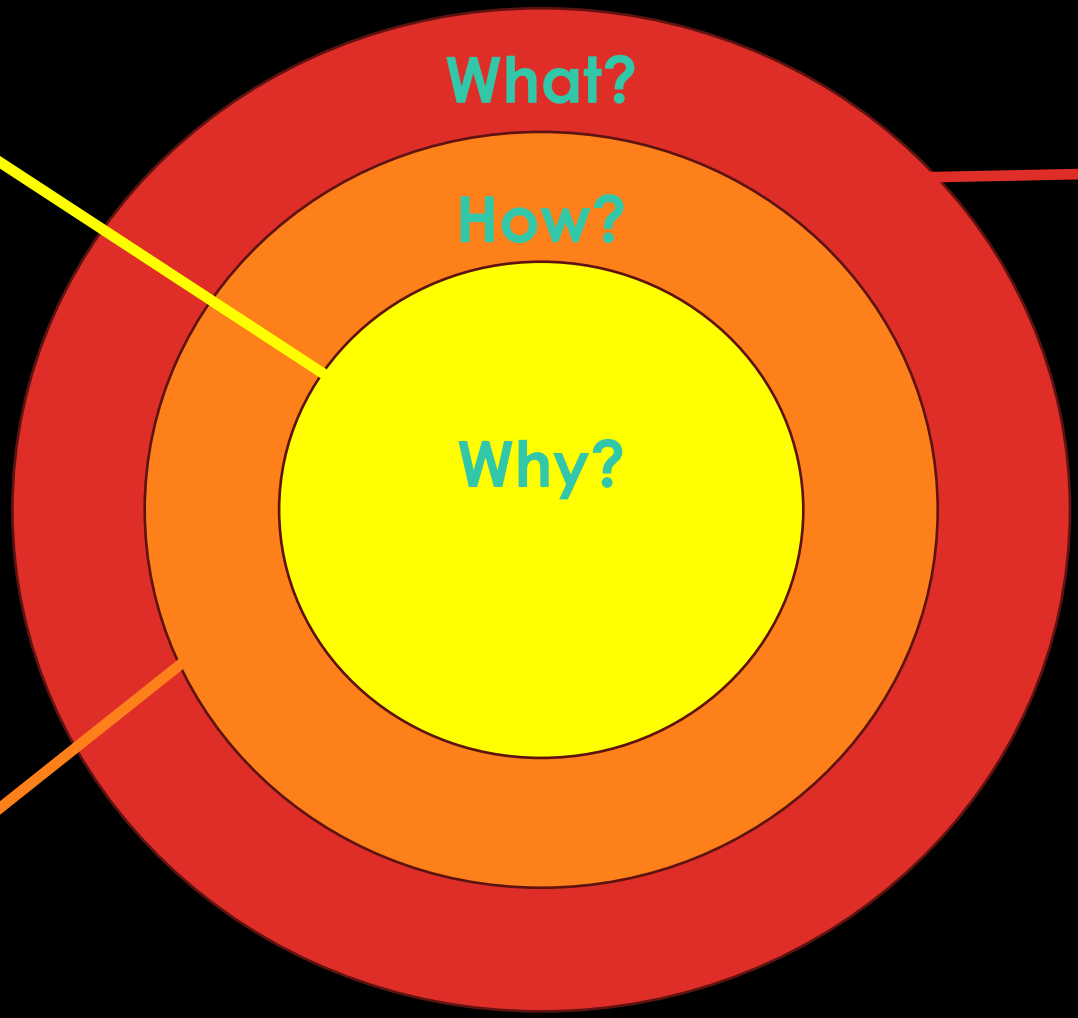
- Wave to wire
- Oscillating water columns (OWC)
- No moving parts in water
- Units can be lined up into a breakwall
- Unidirectional is a technology change from previous OWC style turbines
- Wave energy gives baseload power

Images courtesy of WSE website, https://www.waveswell.com/wp-content/uploads/2021/01/Wave-Swell-energy_Image-KI-Project_Main_V01.jpg

Golden Circle

Newport Beach, with its high population, is in an energy and resource crunch, along with experiencing erosion and habitat loss.

Bridging hydropower technology, electricity, and coastal conservation and restoration as one.



Offer consultation services to match Wave Swell Energy LTD's wave to wire technology with Newport Beach's primary utility company. Then apply profits to conservation and restoration of the coastal areas.

Business Model Canvas

Social Business Model Canvas

TANDEMIC

Key Resources

- Wave Swell Energy partnership
- Subject matter experts

What resources will you need to run your activities? People, finance, access?

Key Activities

1. Relationship with Wave Swell Energy
2. Relationship with utility company
3. Conceptual study at Newport Beach
4. Stakeholder engagement

What programme and non-programme activities will your organisation be carrying out?

Type of Intervention 2

Business Development Consulting firm

What is the format of your intervention? Is it a workshop? A service? A product?

Segments 1

- Home and business owners
- Tourism
- General population

Beneficiary *Who benefits from your intervention?*

Value Proposition 3

- Renewable electricity
- Coastal protection
- Conservation

Beneficiary Value Proposition

Impact Measures

- Renewable energy production
- Protection of coastal lines
- Sea cliff restoration

How will you show that you are creating social impact?

Partners + Key Stakeholders

Partner: Wave Swell Energy
Stakeholders: Government and NGOs

Who are the essential groups you will need to involve to deliver your programme? Do you need special access or permissions?

Channels 6

- B2B model
- Conferences for industry networking
- Direct contact w/ utility providers

How are you reaching your users and customers?

Customer 4

- Direct: utility company
- Indirect: utility company's customers

Who are the people or organisations who will pay to address this issue?

Customer Value Proposition 5

- Attract more customers w/ unique conservation model
- Reliable energy source

What do your customers want to get out of this initiative?

Cost Structure

- Team of experts
- Core team salaries
- Future: new research, travel costs

What are your biggest expenditure areas? How do they change as you scale up?

Surplus

-Conservation/ restoration
-Research

Where do you plan to invest your profits?

Revenue

- Primary: Selling our consulting services to the utility company
- Secondary: Ongoing partnership with WSE technology company

Break down your revenue sources by %

Value Proposition

Offering three prong benefit to customers:

1. Renewable electricity generation from wave power as a baseload renewable power generation
2. Coastal (erosion) protection with the breakwall technology
3. Conservation funding model with a percentage of electricity rate invested in sea cliff restoration

Impact Measures:

- Can demonstrate the MW of renewable energy production over time
- Can directly measure the benefit of the breakwalls to reduce/reverse beach erosion
- Sea cliff restoration benefit can be measured over time through visual tracking and regular testing of soil conditions

Customer Value Proposition:

- Utility company will be able to attract more customers because…
  - Technology/ hydropower plant itself protects sea cliffs from erosion
  - Renewable energy source
  - Percentage of profit going towards sea cliff restoration/conservation
    - Conservation/restoration angle
    - Land owner/property protection from erosion on coast
- Utility company will gain a reliable base load energy source, as opposed to unpredictability of wind/solar power

Type of Intervention Key Activities

Type of intervention:

Business development consulting firm

- offering a "matchmaking service" between the technology company and potential utility firms

Key Activities:

1. Partner with technology company to establish business development model
2. Propose the Newport Beach project to the utility company
3. Develop conceptual study with SME team for utility company
4. Begin stakeholder engagement discussions

Key Resources, Partners, and Stakeholders

Key Resources:

- Primary Partner - Wave Swell Energy (WSE) from Australia, developer of Uniwave®
- Seed Funding - from WSE for Business Development phase
- Team of Subject Matter Experts under the Poseidon Consulting "umbrella"
  - Hydropower, Coastal Engineering & Mgmt, Restoration & Conservation, Energy Project Permitting

Partners: (in addition to WSE)

- Local Electrical Utility Providers (primary target Southern California Edison)
- Conservationists, Botanists, Marine Biologists

Stakeholders:

- Government permitting agencies
- General public
- Special interest groups and NGOs

Segments

Customers - Who will pay?

Utility company (direct)

Utility company's customers (indirect)

Beneficiary - Who will we help?

- Utility companies
- Home and business owners
- General population
- Tourism

Channels

Business-to-business format

Conferences

- marine conservation
- renewable energy generation

Cost Structure

- Low overhead costs
- Core team salaries
- Team of experts

Future:
- complementary technologies to broaden portfolio of services
- central hub
- travel costs

Revenue

- **Primary**: Selling consulting services to utility companies

- **Secondary**: Ongoing partnership with WSE technology company

Surplus

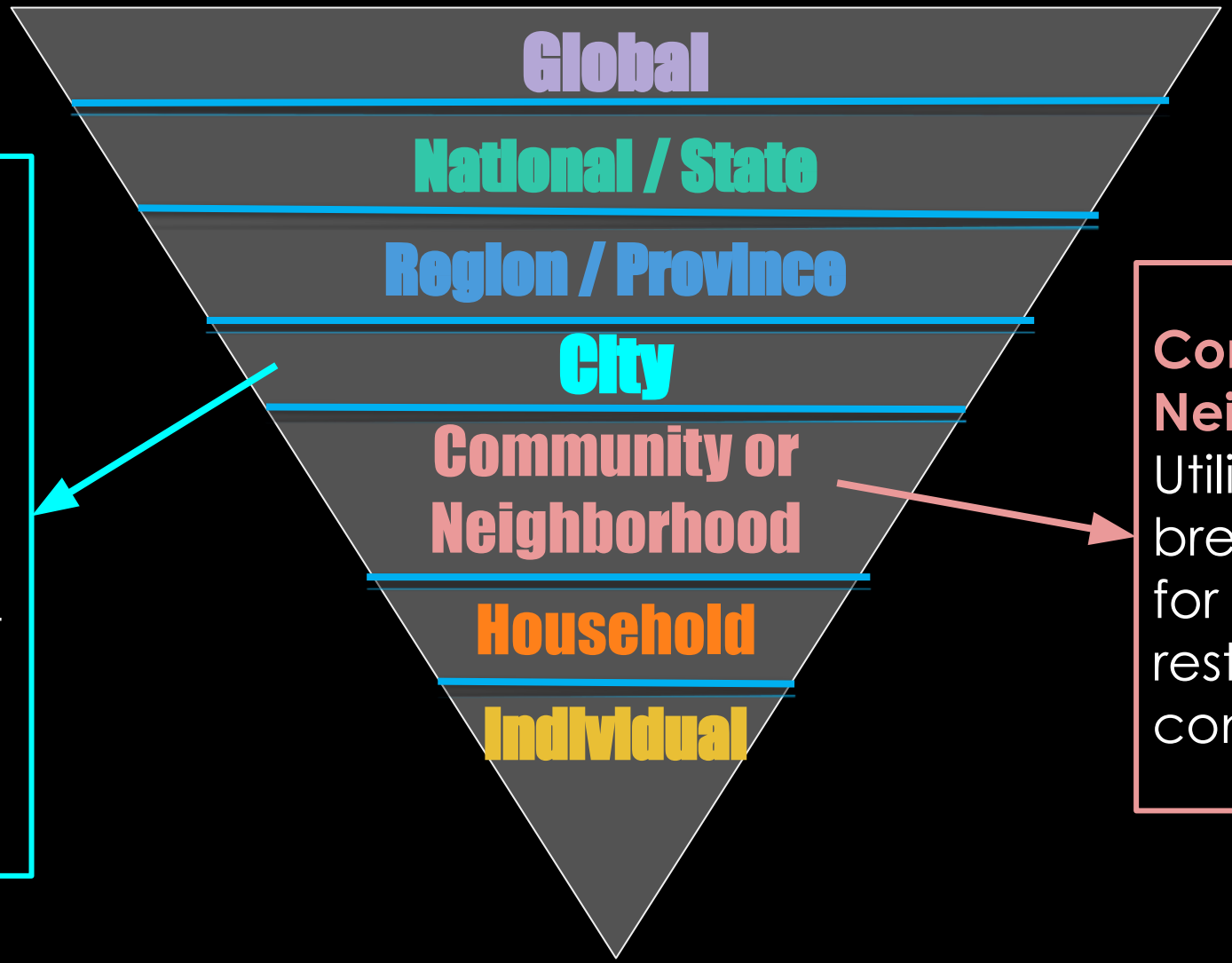
- Note that the timescale for creating a surplus is projected to be longer than average, as these kinds of utility projects with environmental impacts take a long time to shepard through the approvals process, particularly with new technology solutions in new geographies.
- We will propose to the utility company that a small % of the electrical rate is for funding sea cliff conservation/restoration projects, which can be seen as a sales “feature” for the utility company - as an environmental and social benefit for their customers.
- A portion of the profits will be used towards replanting (ethically sourced) native dudleyas to the cliff sides.

Dudleyas

- Dudleyas are a native succulent to the cliffs of California, many of which are critically endangered. Their powerful and extensive root systems help to stabilize cliffs. Due to poaching within the succulent trade, Dudleya populations have dropped drastically, causing major instability in cliff sides in California.

- We will also have measures to prevent future poaching of these Dudleyas.
  - According to *The Guardian,* "in 2021, the California Native Plant Society helped pass a state law specifically criminalizing dudleya poaching, with fines up to $500,000 and six months in prison."

Sustainability Complex



City:
Providing renewable base-load electricity supply and expanding existing system capacity without taking up additional land resources.

Community or Neighborhood:
Utilizing beach breaks and plants for sea-cliff restoration and conservation.

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Sustainable Development Goals

Affordable and Clean Energy

Sustainable Cities and Communities

Climate Action

Life Below Water and on Land

Project References

Wave Swell Energy (WSE) https://www.waveswell.com/

Potential of Wave Energy Conversion to Mitigate Coastal Erosion from Hurricanes
https://www.usgs.gov/publications/potential-wave-energy-conversion-mitigate-coastal-erosion-hurricanes

Article on Dudleya Poaching
https://www.theguardian.com/us-news/2022/mar/20/california-succulent-smuggling-dudleya#:~:text=In%202021%2C%20the%20California%20Native,and%20six%20months%20in%20prison.

Rafael J. Bergillos, Cristobal Rodriguez-Delgado, Gregorio Iglesias, Oct. 7th 2019, "Ocean Energy and Coastal Protection, A Novel Strategy for Coastal Management Under Climate Change"