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EH 210: Social and Sustainable Innovation Driven by the Sustainable Development Goals





The big picture: Sustainable Development Goals



[Home](#) >





Would Innovation help in achieving SDGs?



Home >



—
**La Herramienta de
Confianza del Agricultor**

This startup reduces pesticides' consumption by 90% and fertilizers' consumption by 50% while improving production yields for food production

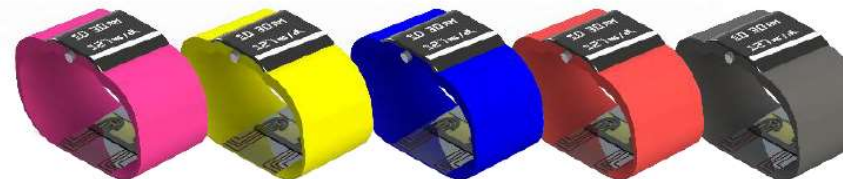
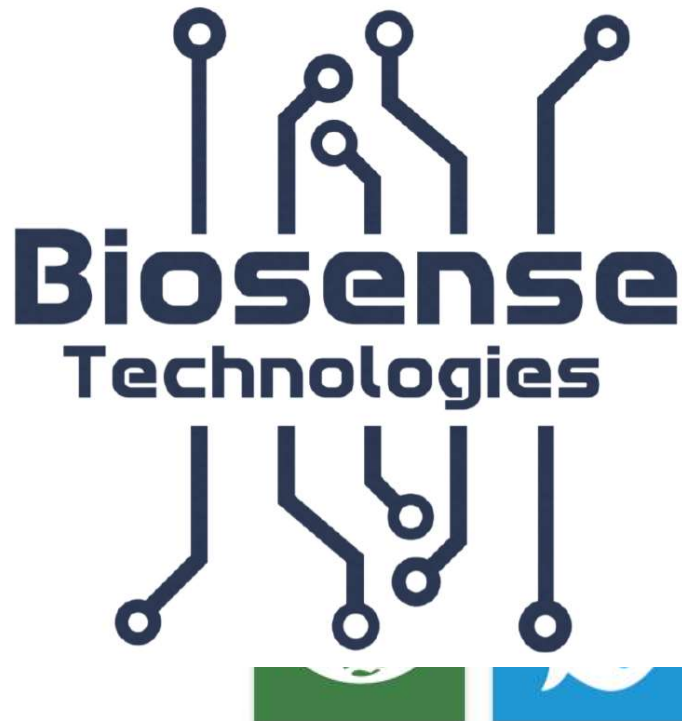




Would Innovation help in achieving SDGs?



This startup developed a non-invasive glucometer that measures blood sugar and other health metrics in real time, it might help in managing diabetes and cardiovascular disease effectively to prevent hundreds of thousands of premature deaths and millions of disability days worldwide





Would Innovation help in achieving SDGs?



50
YEARS

UNDP around the world ▾ About us Publications News Centre Funding ▾

United Nations Development Programme

English | Español

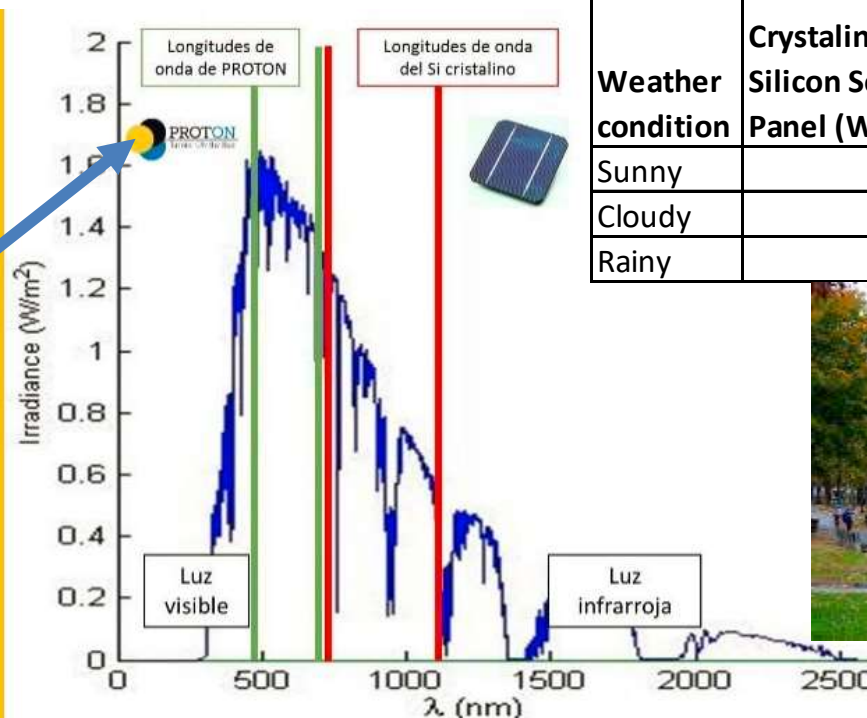
Search



This startup developed a “biological” solar panel that performs better than silicon photovoltaic panels in “low irradiation” conditions which are prevalent for half of the year in Canada, Northern USA, Northern Europe, Japan, Korea and Russia.



SUSTAINABLE
DEVELOPMENT GOALS



Weather condition	Crystalline Silicon Solar Panel (W/m2)	Proton Solar Panel (W/m2)	Proton Performance
Sunny	87	86	-1.15%
Cloudy	25	38	52.00%
Rainy	9	16	77.78%



GOALS



Issues that hinder innovation and sustainability

All of the ideas previously shown come from great minds, do you agree with this?

However, all of these individuals live in cities with inexistent or very low support systems to scale-up innovation ideas



Miguel



Cristina



Julio

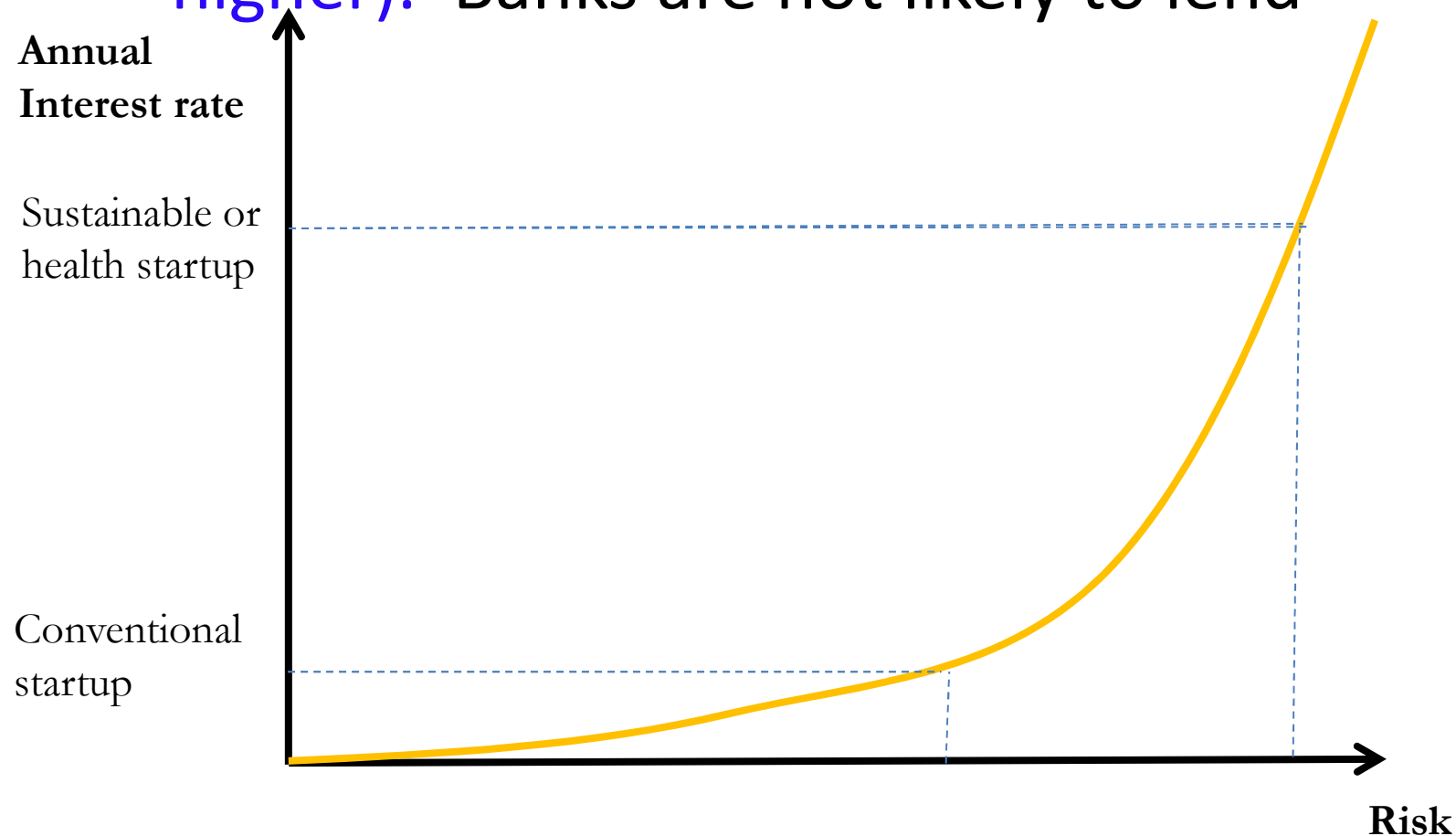


Christian



Issues that hinder innovation and sustainability

- Health and sustainability businesses are riskier than conventional businesses (cost of money is higher). Banks are not likely to lend





Issues that hinder innovation and sustainability

- There is a sweet spot when individuals have both **high creativity and innovation: Young Adults (late teens to mid thirties)**

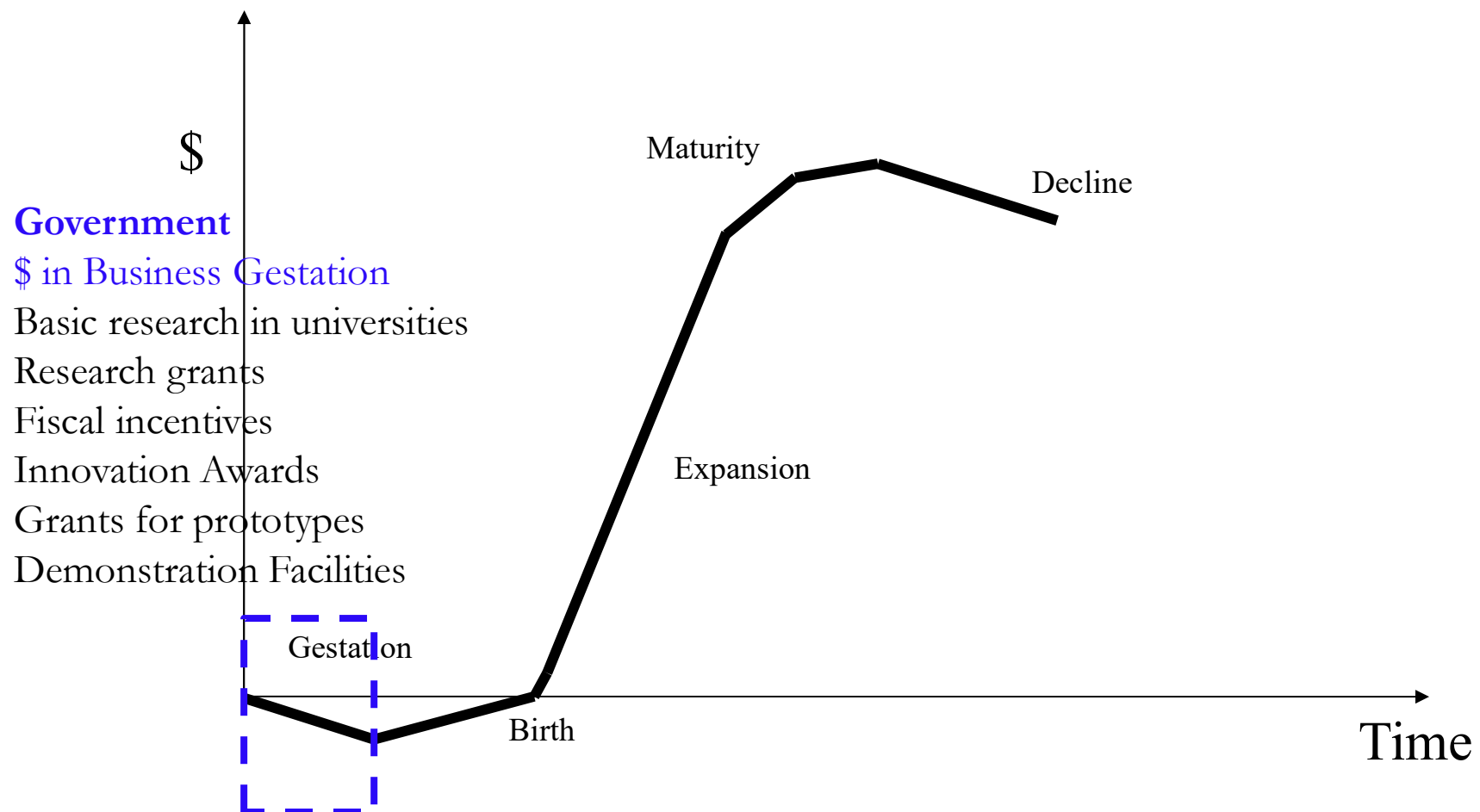


Young Adults= Maximum creativity + high innovation levels + time available+ inexperienced + no money + no credit history+ student loans + desire for professional growth + drive to start a family. **Therefore society recommends NO RISKY BUSINESSES**



Issues that hinder innovation and sustainability

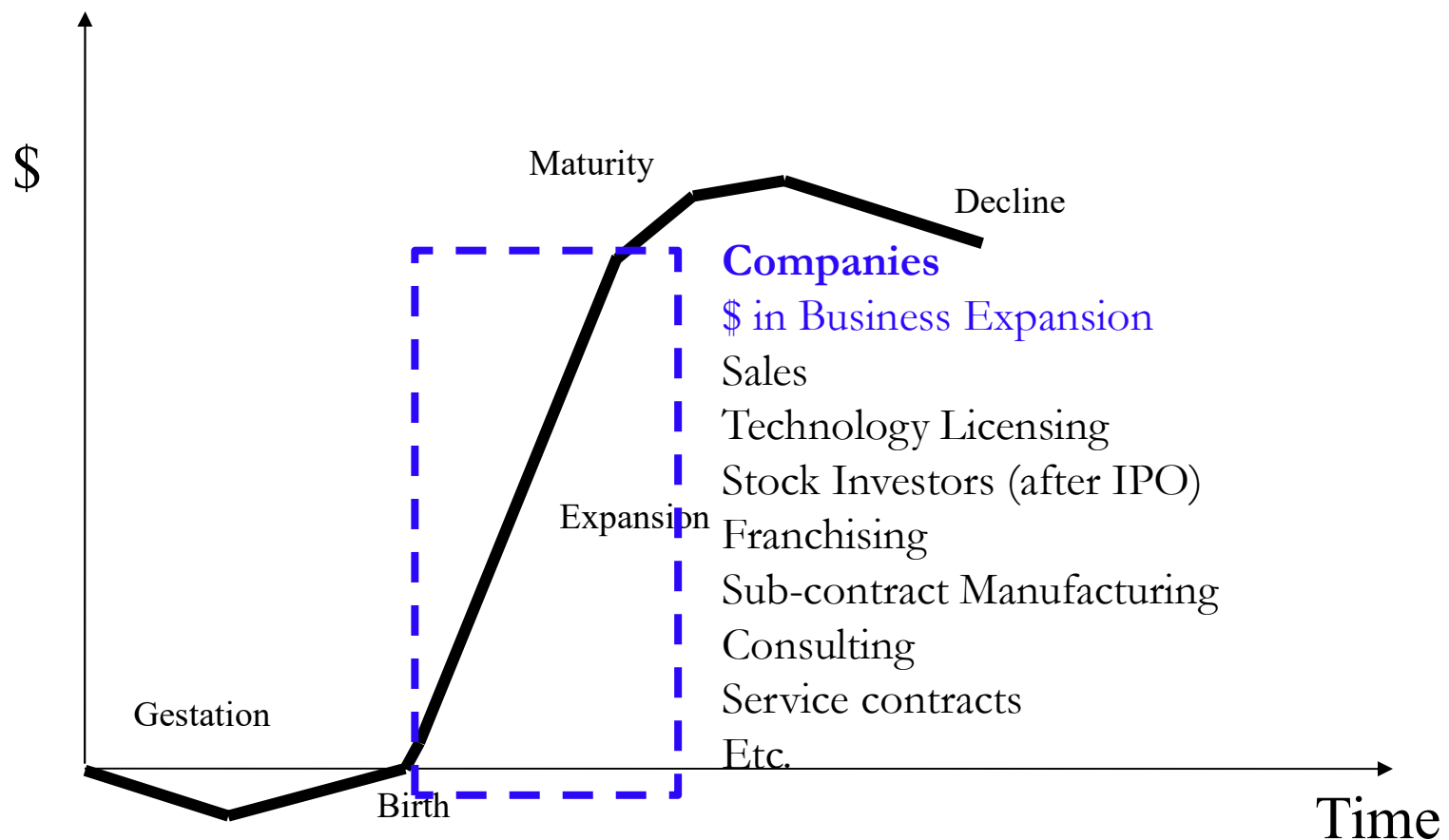
- Early gestation for innovation is paid by the government (from idea to demonstration)





Issues that hinder innovation and sustainability

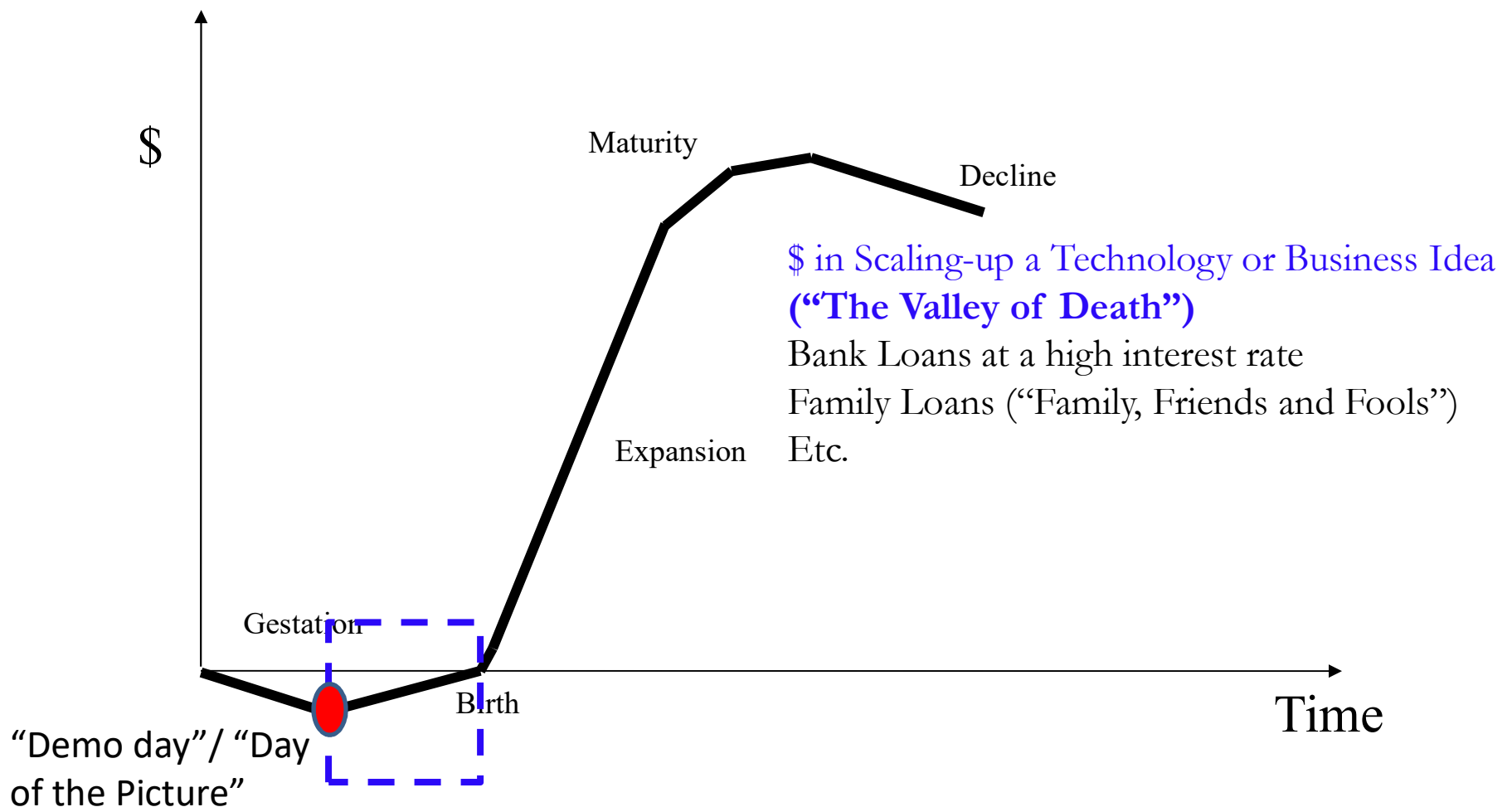
- During the **expansion** stage of a business, **the company self-finances growth**





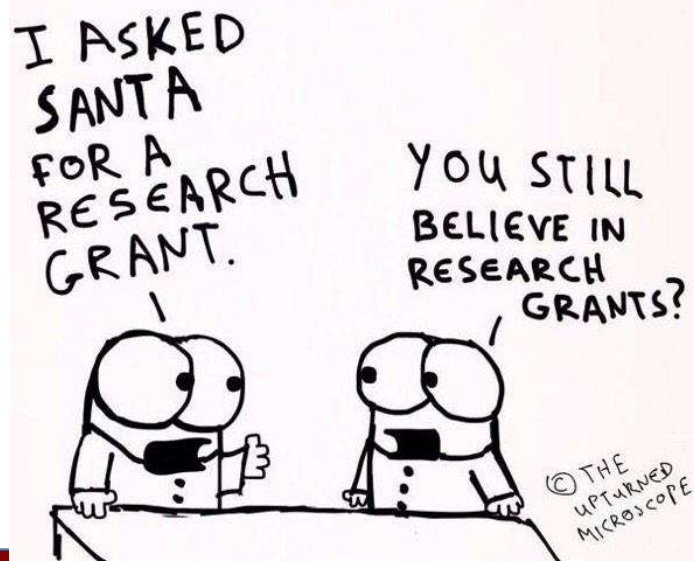
Issues that hinder innovation and sustainability

- Between concept demonstration and profitability there is the “Valley of Death”





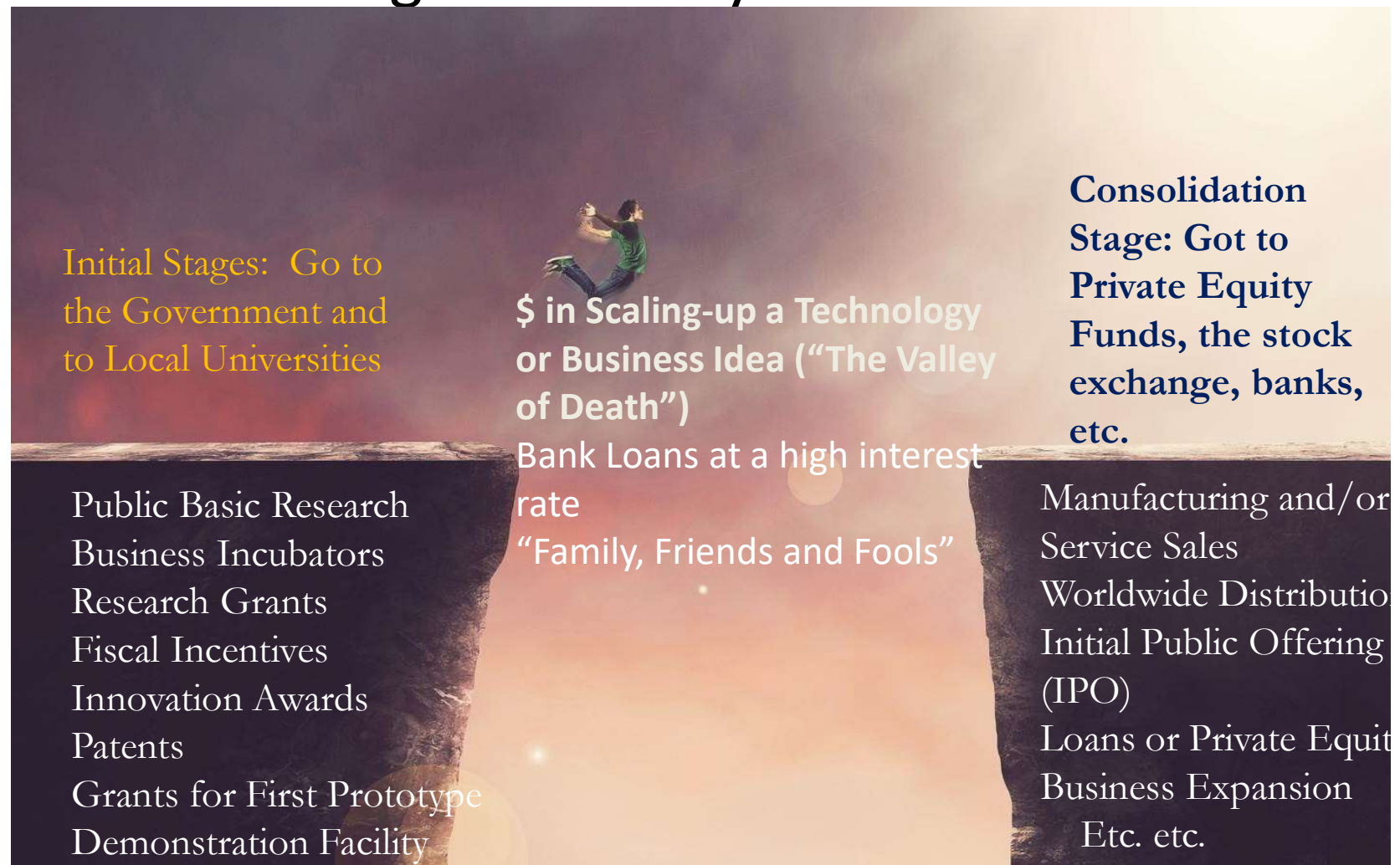
Issues that hinder innovation and sustainability





Issues that hinder innovation and sustainability

- Overcoming the “Valley of Death”





Issues that hinder innovation and sustainability

- In cities with undeveloped support systems for innovation, 75% of technology, sustainable or health startups fail (successful businesses are...)





Harvard's goal for teaching EH 210

- Unofficial mission: Ensure that young adults with no credit history but great ideas can get funded to create startups in sustainability and health to reduce the carbon footprints and health burdens on governments, universities and society in general





Main Topics for EH 210

- Climate Change Preparedness and Carbon Mitigation and Adaptation Technologies and Practices
 - Principles of climate change
 - Main carbon reduction technologies
 - Climate change adaptation practices
 - Assessment of community vulnerabilities and resiliency enhancement to climate change



Main Topics for EH 210

- Climate Change Preparedness and Carbon Mitigation and Adaptation Technologies and Practices





Main Topics for EH 210

- Climate Change Preparedness. Example: Bangladesh





Main Topics for EH 210

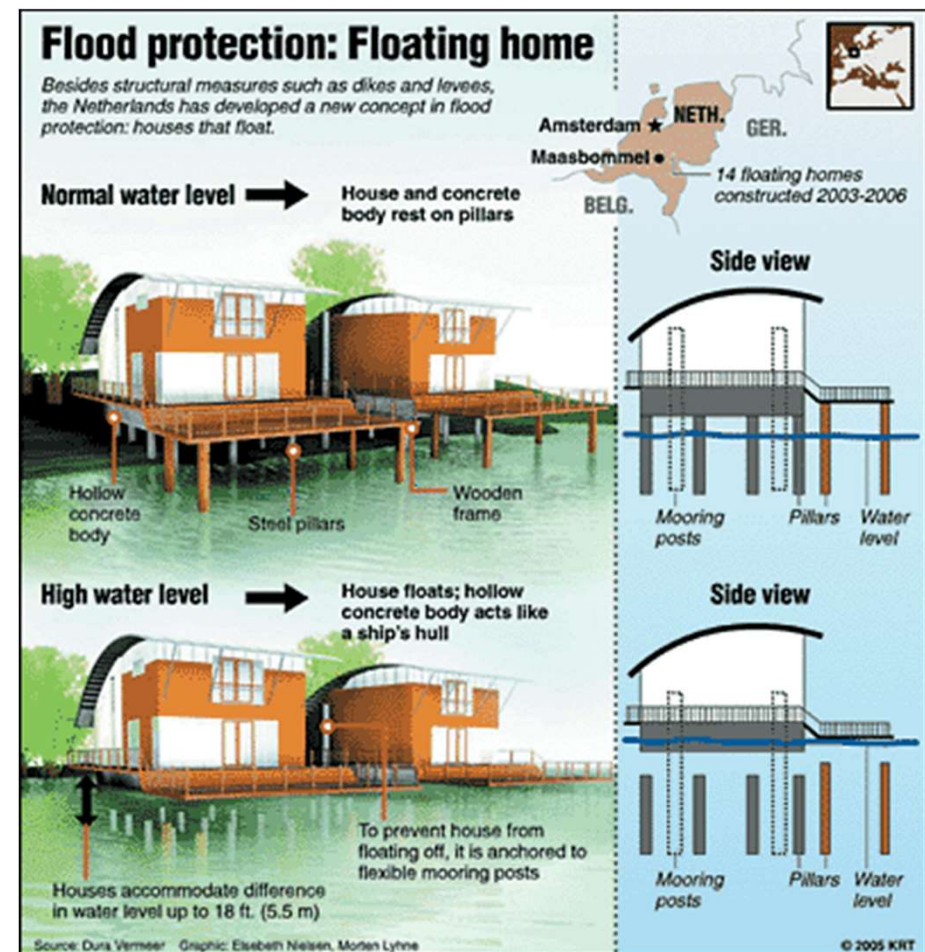
- Climate Change Preparedness. Example: Bangladesh
 - Minimum prediction (1 m sea-level rise by 2100)
 - 30 million people displaced
 - 20% of the land will banish
 - 30% of the rice crop will disappear





Main Topics for EH 210

- Vulnerability Assessment + Resiliency Enhancement = Climate Change Preparedness





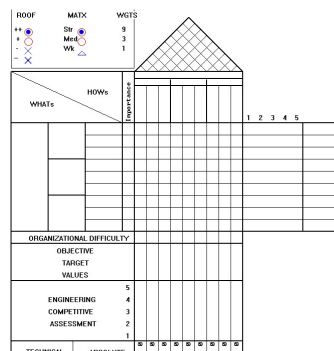
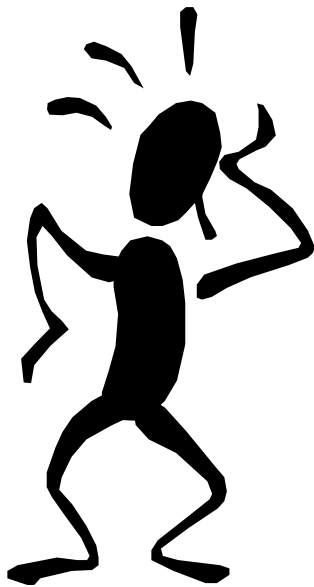
Main Topics for EH 210

- Sustainable Development of New Products and Services
 - Market intelligence (what do people really want?)
 - Intellectual property (patents, trademarks, copyrights)
 - Techniques to enhance creativity and innovation
 - Principles of sustainable product/service design
 - Life cycle thinking and the circular economy
 - Assessment of health and environmental impacts (good and bad) of products and services



Main Topics for EH 210

- Sustainable Development of New Products and Services



VS





Main Topics for EH 210

- Sustainable Development of New Products and Services



(12) **United States Patent**
Sanchez et al.

(10) Patent No.: **US 6,803,775 B2**
(45) Date of Patent: **Oct. 12, 2004**

(54) **FUEL QUALITY SENSOR ASSEMBLY AND METHOD OF USE**

(75) Inventors: **Ramon A Sanchez, Juarez (MX); Santos Burrola, Juarez (MX)**

(73) Assignee: **Delphi Technologies, Inc., Troy, MI (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 40 days.

(21) Appl. No.: **10/254,347**

(22) Filed: **Sep. 25, 2002**

(65) **Prior Publication Data**

US 2004/0056670 A1 Mar. 25, 2004

(51) **Int. Cl.**⁷ **G01R 27/08; G01R 31/08; G01F 1/58**

(52) **U.S. Cl.** **324/698; 324/724; 324/515; 73/861.15**

(58) **Field of Search** **324/698, 722, 324/515, 695, 664, 693, 691, 724; 123/494, 511; 73/861.15, 53.05**

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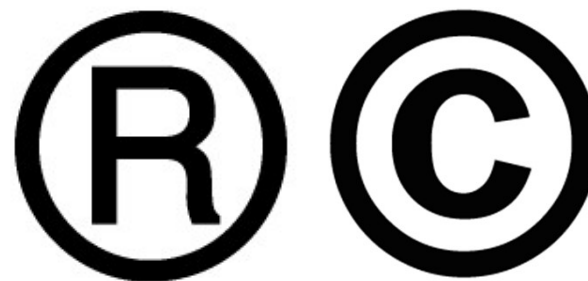
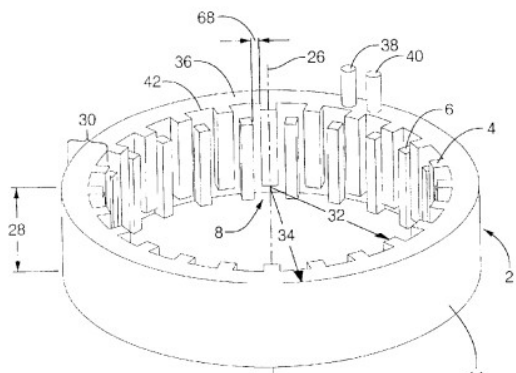
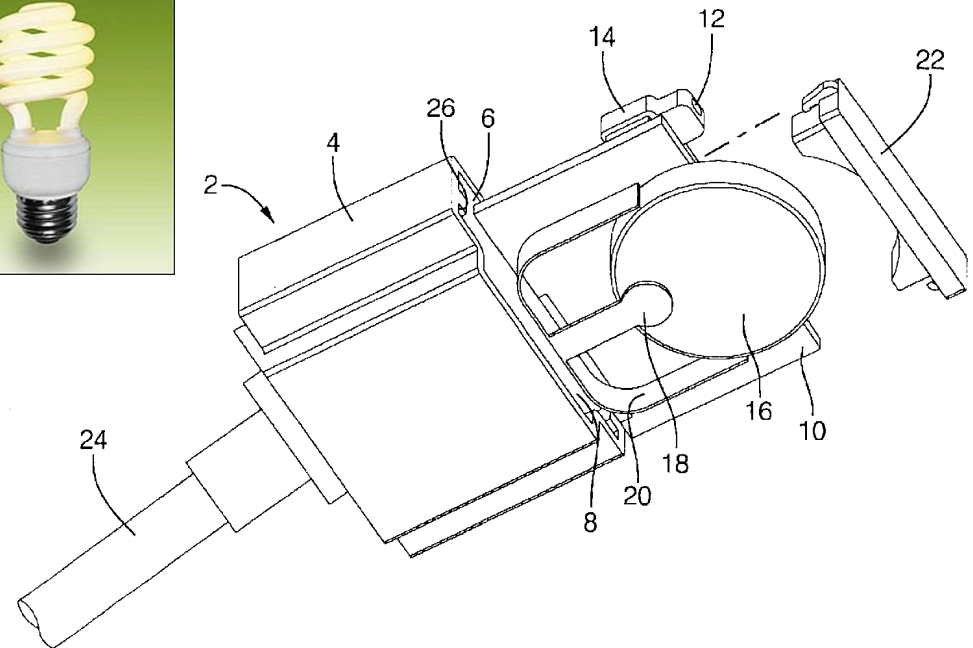
Primary Examiner—Anjan K. Deb

(74) Attorney, Agent, or Firm—Jimmy L. Funke

(57) **ABSTRACT**

A sensing element (2) for sensing a fluid (50) composition and a method of using the sensing element (2) are provided. The sensing element (2) includes an electrode base (36) having a first electrode (4) and a second electrode (6) disposed on the electrode base (36); the first electrode (4) and a second electrode (6) being electrically isolated one another except through an external circuitry (64); the first electrode (4) and the second electrode (6) defining a gap (42) between one another such that electrical conduction through a fluid (50) within the gap (42) is proportional to the composition of the fluid.

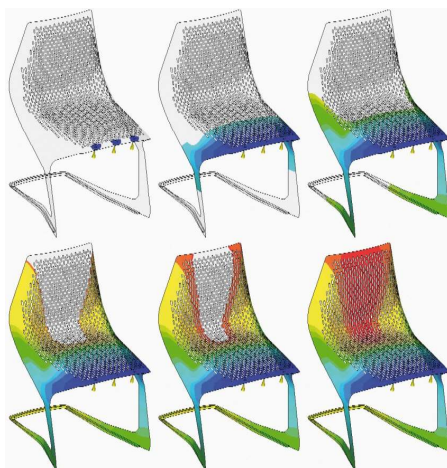
29 Claims, 2 Drawing Sheets





Main Topics for EH 210

- Sustainable Development of New Products and Services

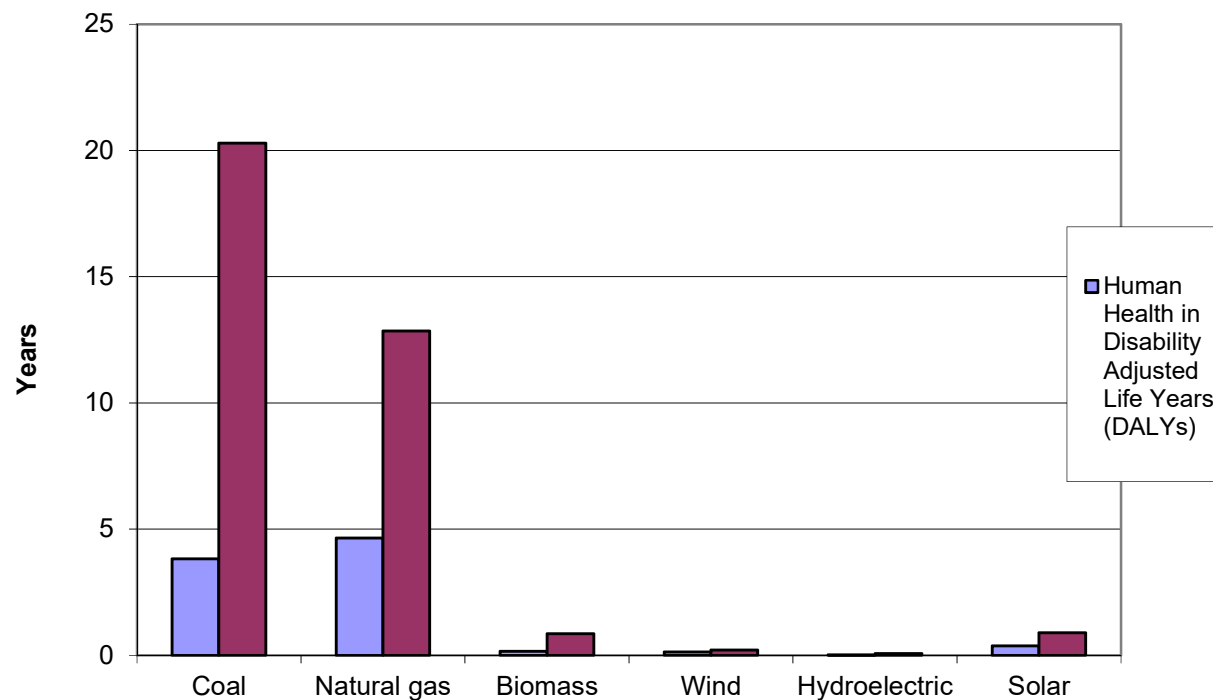




Main Topics for EH 210

- Sustainable Development of New Products and Services
 - Renewable energies are less damaging for the environment and health (effects of 1 Million KWh)

Human Health and Ecosystem Diversity Endpoint Indicators





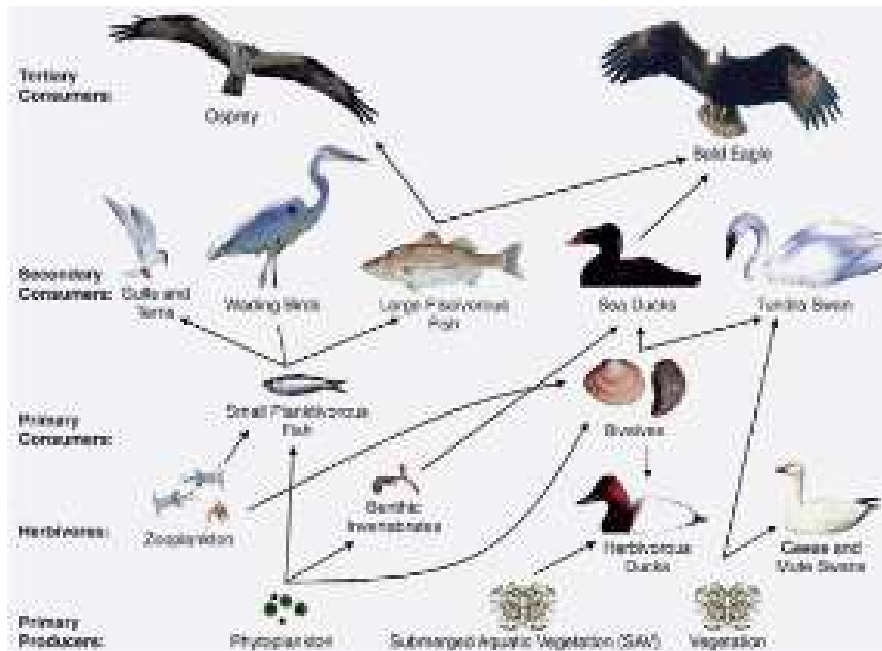
Main Topics for EH 210

- Social and Sustainable Startup Development (to enhance your chances of getting funded)
 - Basics of the Innovation Ecosystem (startups, angel investors, venture capitalists, venture philanthropists)
 - Conventional VS Innovation Financing
 - How to prepare a sustainable business plan
 - How to do a business pitch or social impact presentation to potential investors or foundations



Main Topics for EH 210

- **Innovation Ecosystem** is the regional scheme to create high tech startups, it requires the participation of the whole community to make it work in an effective way (it is similar to what happens in nature where interdependency of biological species creates a balance that maintains a healthy local system).





Main Topics for EH 210

- Social and Sustainable Startup Development (to enhance your chances of getting funded)

Overcoming the “Valley of Death”

Initial Stages: Go to the Government and to Local Universities

Public Basic Research
Business Incubators
Research Grants
Fiscal Incentives
Innovation Awards
Patents
Grants for First Prototype
Demonstration Facility

\$ in Scaling-up a Technology or Business Idea (“The Valley of Death”)

Bank Loans at a high interest rate
Family Loans
Angel Investors
Venture Capitalists
“Crowdsourcing”
University Collaborations
Business Accelerators
Government Interventions

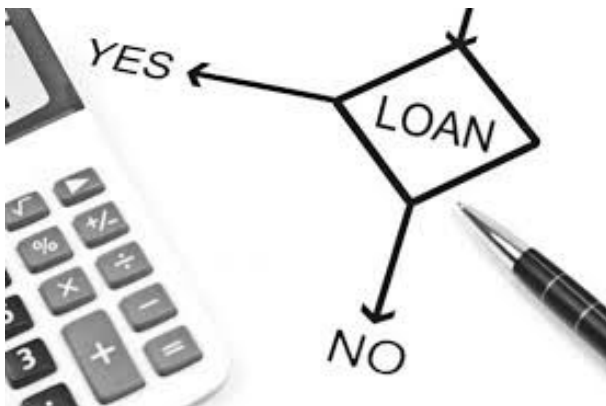
Consolidation Stage: Got to Private Equity Funds, the stock exchange, banks, etc.

Manufacturing and/or Service Sales
Worldwide Distribution
Initial Public Offering (IPO)
Loans or Private Equity
Business Expansion
Etc. etc.



Main Topics for EH 210

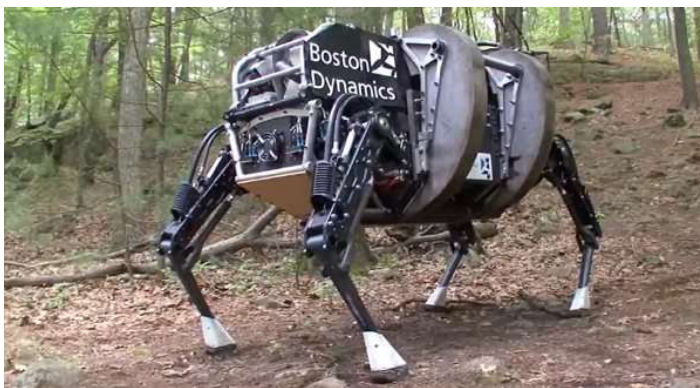
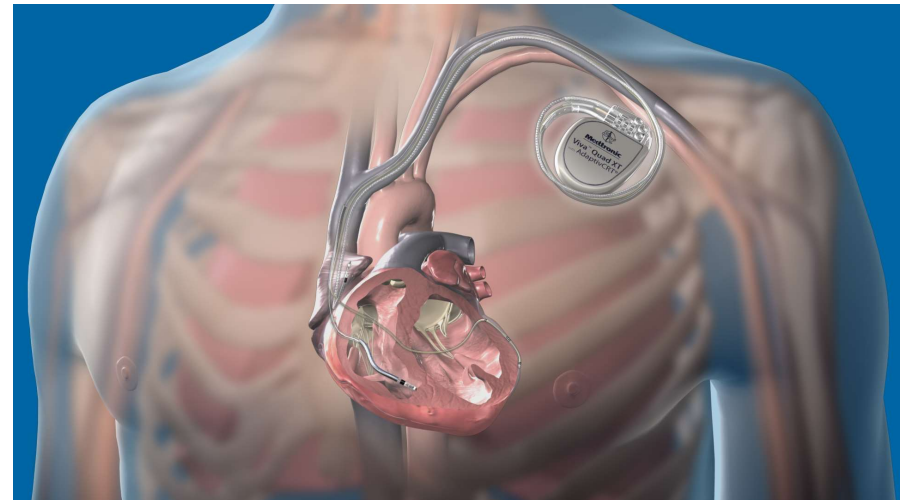
- Social and Sustainable Startup Development (to enhance your chances of getting funded)





Main Topics for EH 210

- Bostonian Innovation Ecosystem





Grading for EH 210

Ordinal and P/F options, 2.5 credits

- Blogs and community outreach to prepare climate change preparedness plans (40%)
- Business or Social Plan for a positive startup (50%)
- Business or Social pitch for your startup (10%)



Schedule and location of Winter Session (EH 210)

- This class will be taught in the Yucatan Peninsula in Mexico from January 7th to 18th of 2019
- We will provide lodging
- We will provide assistance for traveling (up to \$600)





Application process for EH 210

This is for graduate students only

- To apply to EH 210, please download the application form available at <https://canvas.harvard.edu/courses/33944/files/>
- You will also need to select a Sustainable Development Goal and write an essay to propose a solution and a potential startup to implement it (500 words or less)
- Send the application and essay to Dr. Ramon Sanchez at rsanchez@hsph.harvard.edu before Nov 2 @ 11:59 PM



Pictures from January of 2018





Pictures from January of 2018





Questions?

Dr. Ramon Sanchez. E-mail: rsanchez@hsph.harvard.edu

You might also contact Aleyda Villavicencio:

avillavicencio@hsph.harvard.edu

