



SANTA CLARA UNIVERSITY

# Proposal preparation

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**Mechanical Engineering**

**Oct. 9<sup>th</sup> and 13<sup>th</sup> 2014**

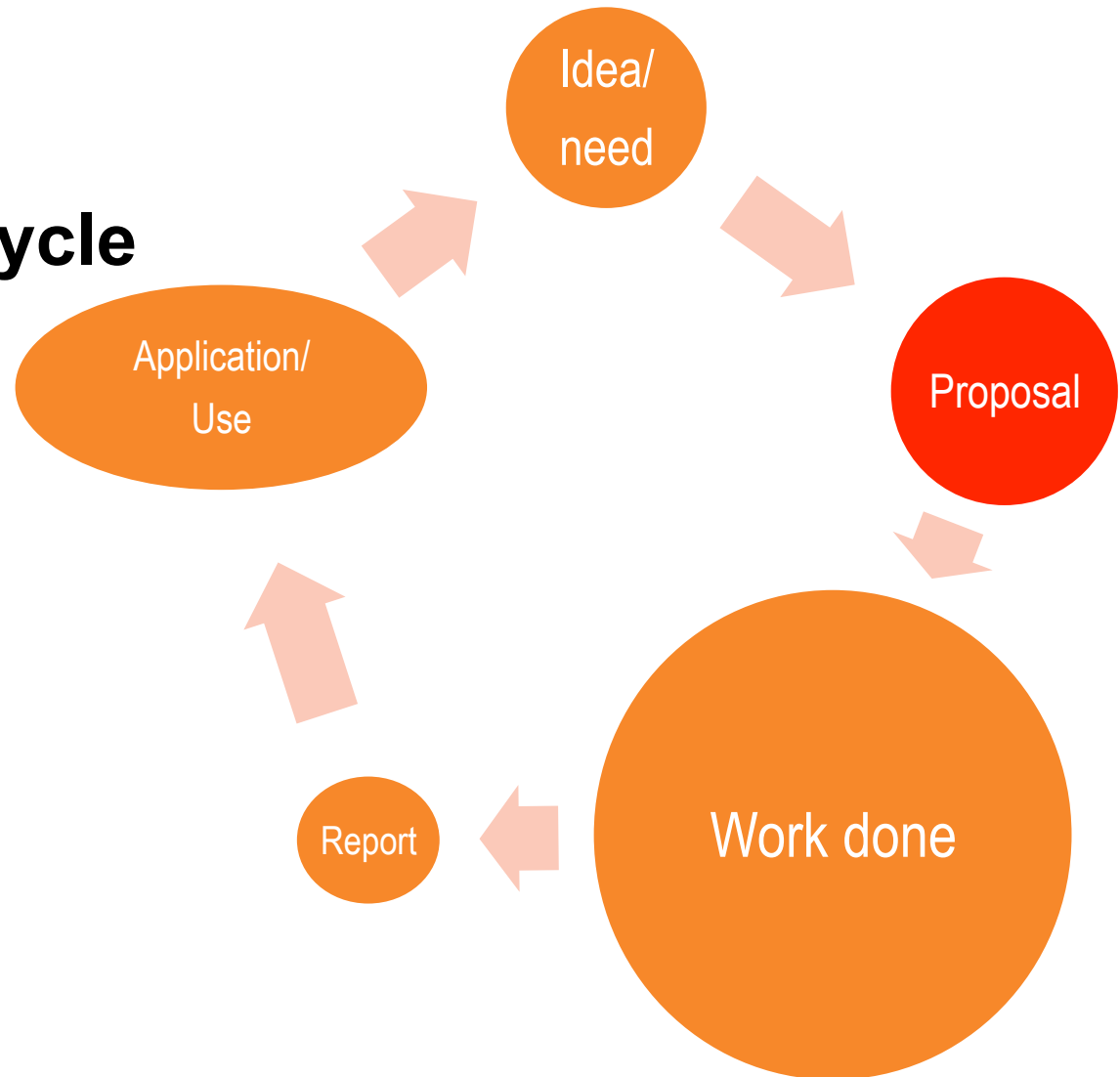


## Topics for discussion

- **A proposal is...**
  - a request to share in an activity. The activity or project is enabled through the merger of ideas, efforts, and funds.
- **What makes a good proposal, overall:**
  - Components: Introduction, Project Description, Scope of work, Benefits
- **Process to create a proposal**
  - Ideas
  - Requirements
  - Review



## Research and development cycle





## Proposal Example

### Shrouded Small Wind Turbines

*Safe, Reliable, and Renewable Energy with a Global Impact*

**Kristen Flannery**

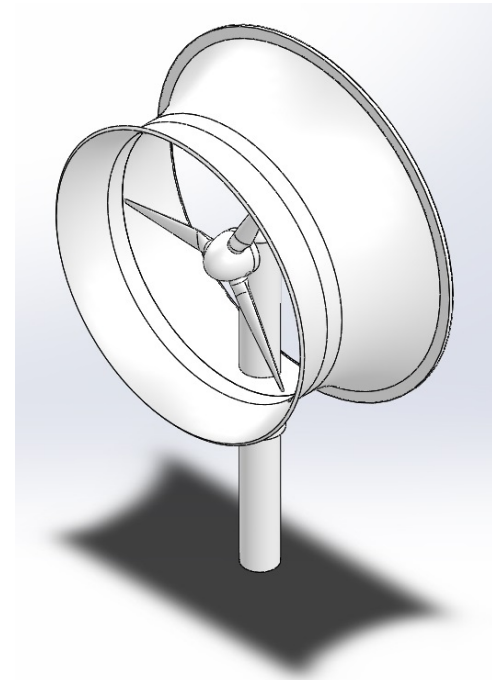
Mechanical Engineer '14

**Mike Holligan**

Mechanical Engineer '14

**Joe Soares**

Mechanical Engineer '14





## Proposal Components

These sections are generally used

- **Introduction**
  - Starting point for the reader. Know your audience?
- **Project Description**
  - What needs to be done?
- **Goals and Scope of work**
  - What will you do: Scope
  - What are the targets? Goals & Deliverables
- **Benefits**

## Small Wind Market Overview

Currently about 250 companies in 26 countries manufacturing small wind turbines.

- Primary barriers to market penetration:
  - 1) High cost of current systems;
  - 2) Manufacturability ....

## Our Solution: Shroud Attachment

Shift of wind speed, improve power



## Global Energy Deficit



Source: World Energy Outlook 2012

Good start, need second reference on world-wide wind power



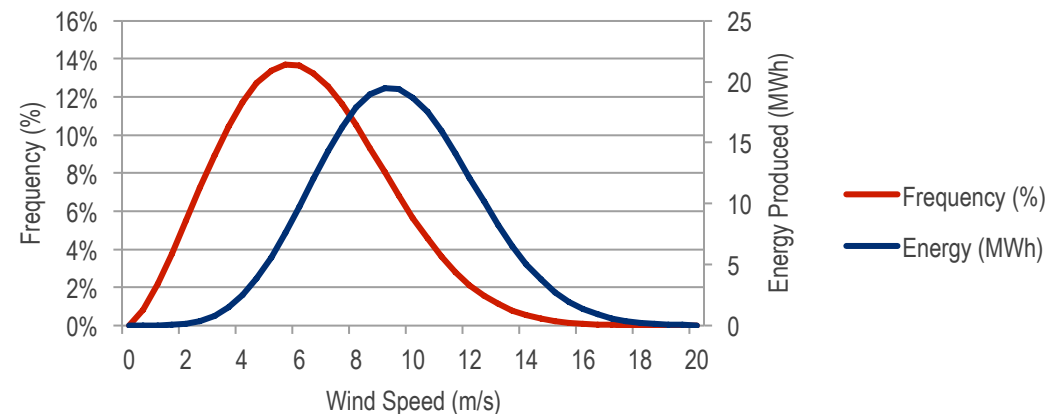
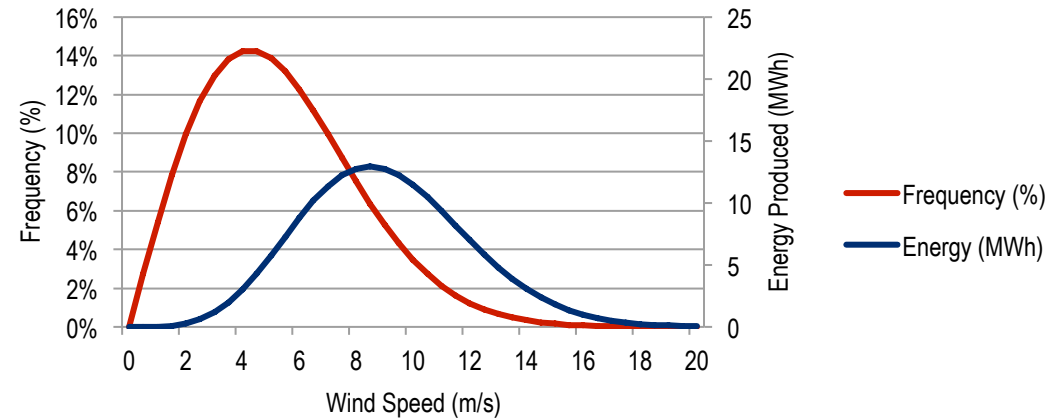
## Our Solution

- **Objectives:**

- Increase wind velocity range of the turbine
- Extend the duration of operation at optimum wind velocity

- **Our prototype**

- Increase the local inlet wind speed by mounting a shroud attachment



Make the graphs bigger and use some arrows



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- **Benefits**

### Design Process

- CFD Modeling with ANSYS
- Wind Tunnel Testing

### Easy and quick installation

### Low maintenance

### Generation of local employment

### Economical

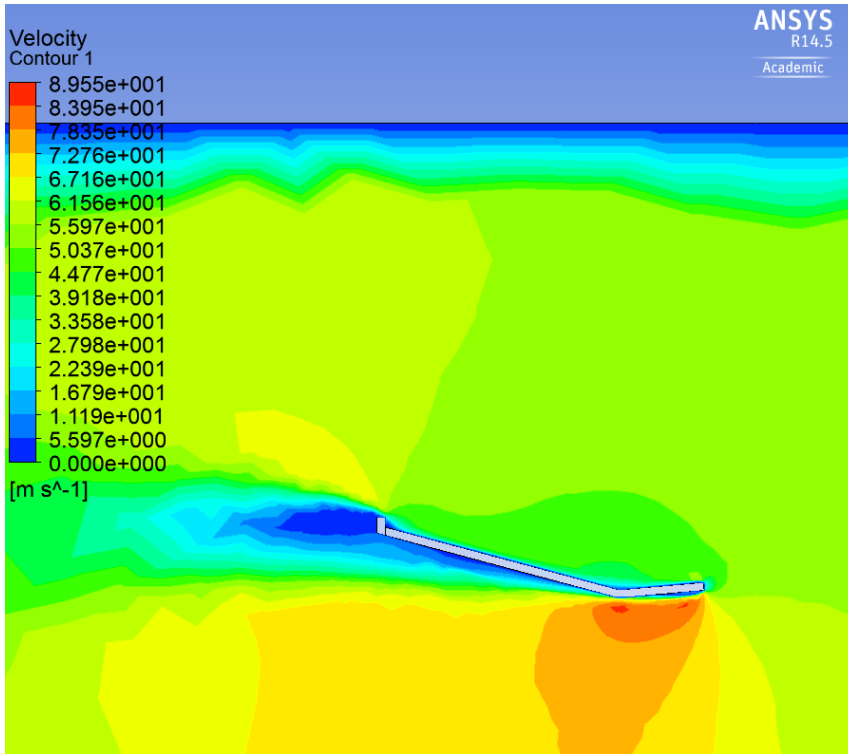
### Mitigation of climate change



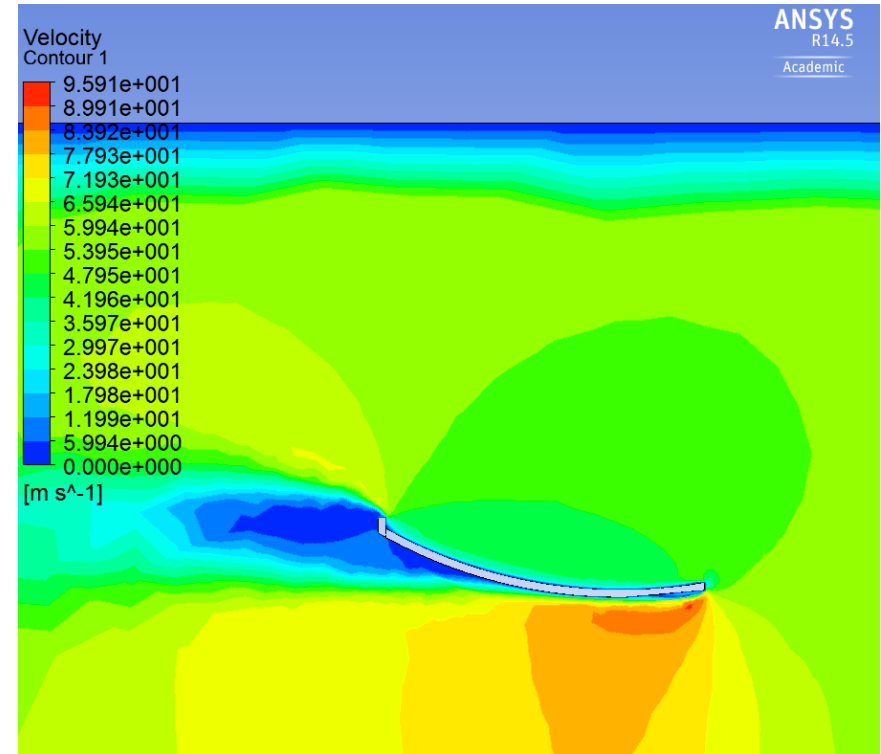


## CFD Modeling: Velocity Contour

- Addition of curvature increases local inlet velocity



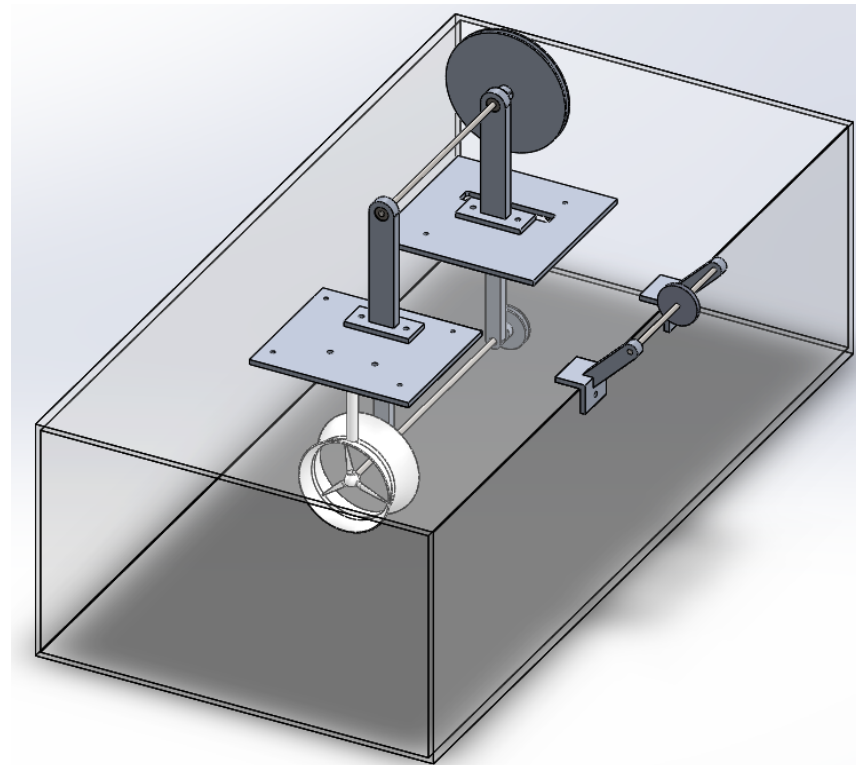
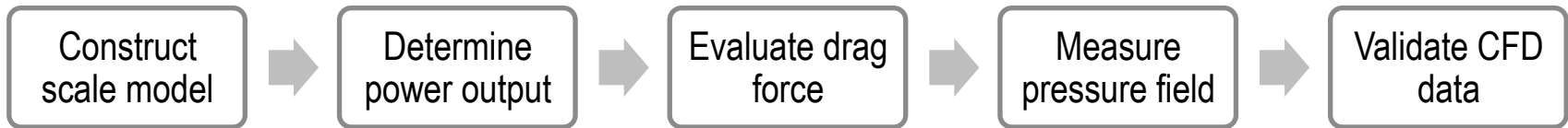
Without Curvature



With Curvature



## Wind Tunnel Testing: Prototype Design





## Design Impact: Chile Case Study



Cite sources of data.

Total Energy Demand	39340 kWh / yr
Energy by Wind Turbine	19710 kWh / yr
Annual Diesel Consumption	5300 liters / yr
Cost of Diesel	\$ 0.30 / kWh
Specific Fuel Consumption	0.27 liters / kWh
Power Enhancement Factor	2.73
Energy by SSWT	53808 kWh/yr
Additional Energy Produced	14469 kWh/yr
Total Annual Savings	\$ 5889
Annual Savings Per Household	\$ 143.63

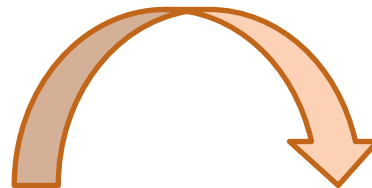


## The Process

### Think about your idea

- What do you want to do?
- What are the steps? What are the connections?
- What do you need: time, money, people?

## Check



### What does the RFP ask for?

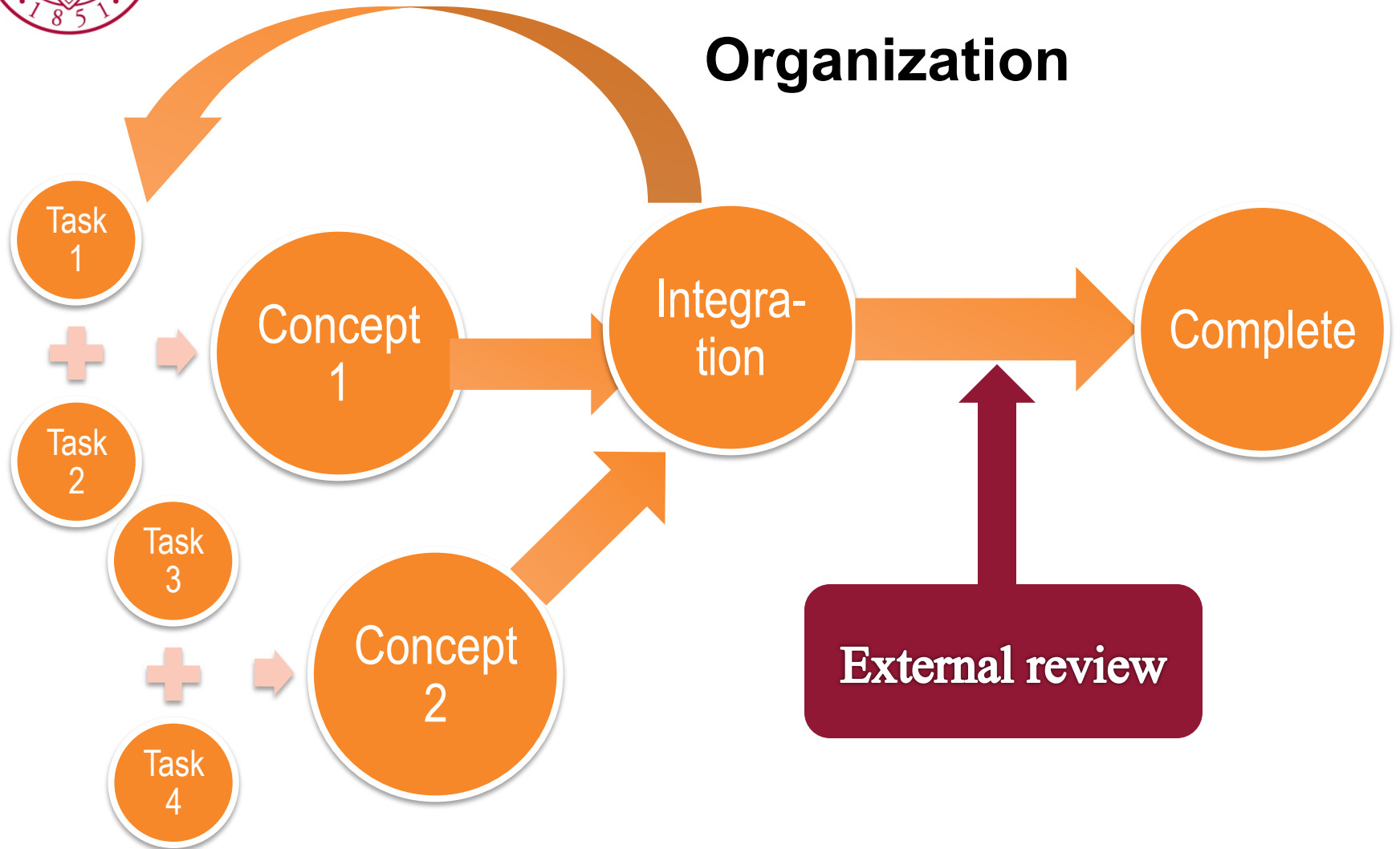
- Read the components
- How do you match with the components?
- Ask questions: be precise and focused (maybe after you have written those sections)



**Your final proposal and project MAY be very different from your first idea.**



## Organization





## The Review

- **The reviewers will judge based on the criteria in the RFP**
  - Each area may be assigned a number of points or a fraction of the total score.
- **The reviewers will judge if the project is realizable (generally feasible, can be done based on the request)**
- **Think about what will the benefit to the organization; what you will complete and send back.**



## Main Points

- Address the main requirements of the RFP
- Spend time to formulate on your own as well as work to meet the RFP, work in parallel but meet at intervals
- Your ideas and proposal may grow (don't limit yourself on the initial idea)
- Spend the time to write well including a good introduction, abstract, scope, ....
- Think about the reviewers frame of mind
- Make the project realizable.