

OFFSHORE WIND TURBINE

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Team #12

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OUTLINE

- **Scope**
- **Fall Semester Highlights**
- **Recent Progress**
- **Future Work Plans**

SCOPE

■ Objectives

- Reduce the cost
 - Autonomous navigation
 - Twin tower design
 - Catamaran base
 - Dry-dock construction

■ Background

- Potential energy production
- Growing industry
- Costs of offshore v. land-based

FALL SEMESTER HIGHLIGHTS

- **Determination of largest costs**
 - Foundations/anchoring
 - Construction
- **Design Innovations**
 - Twin tower design
 - Autonomy
 - Swath base design



RECENT PROGRESS

- Development of experimental program for serviceability of structure
- Testing of structure for serviceability
- Procurement almost complete
- Assembly begun

Section 1

PROGRESS ON ASSEMBLY



POTENTIAL/CURRENT CHALLENGES

- Levels of difficulty
 - Basic (propulsion, generation, stationary)
 - Advanced (sensors, gps, sonar, etc.)
- Scaling Comparison
- Anchoring System
- Electronic Insulation/Sealants
- Buoyancy
 - Very Rigid Body ~ 22 lbs.



RELEVANT DATA AND ANALYSIS

3 Main Design Criteria:

1. Autonomy-Static Location

- Arduino Technology

2. Serviceability and Rotation Limit

- Maximum Displacement of 10 deg.

3. Efficiency of Electricity Generated

- Comparison Onshore vs. Offshore

Section 2

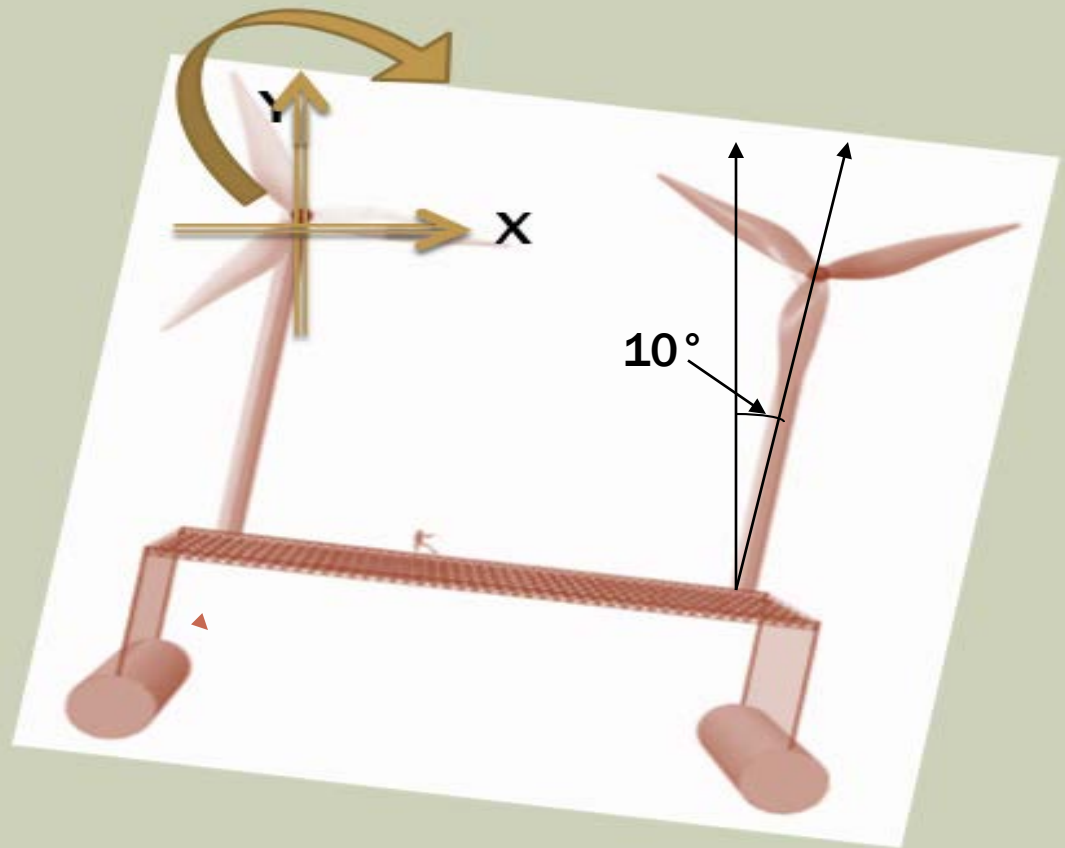
1. AUTONOMY: BASIC PRINCIPLES AND COMPONENTS

- Biggest contributor to industry
- Using Arduino to control motors
 - Underwater vs. Power Generation
- Using timing delays to simulate real world application of GPS



2. SERVICEABILITY AND ROTATION LIMIT

- Wave Pool Testing Facility
 - Strain Gauges
 - Deflection Meters
- Floating allows for more flexibility
- Ballast System considered but not necessary for scale down model



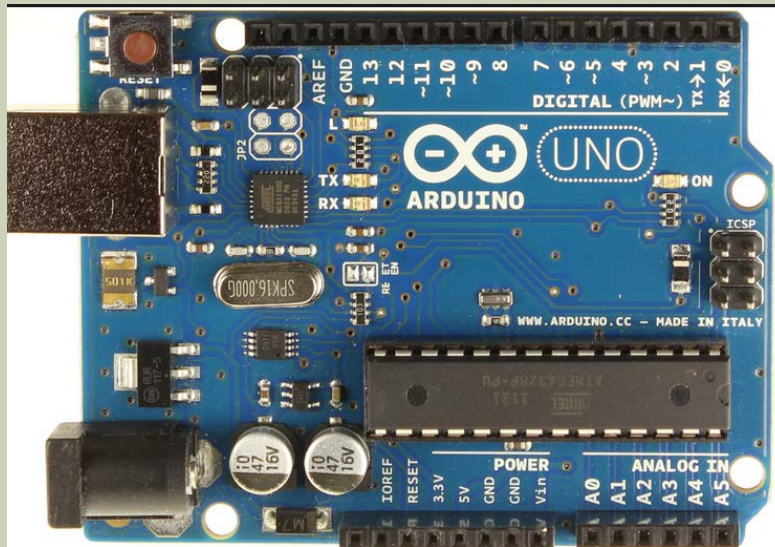
3. POWER EFFICIENCY

- Basic objective is to make power (LED)
- Comparison of Land vs Sea
 - Objective: Close as possible



PROCUREMENT

- Recent Purchases
- Future Purchases

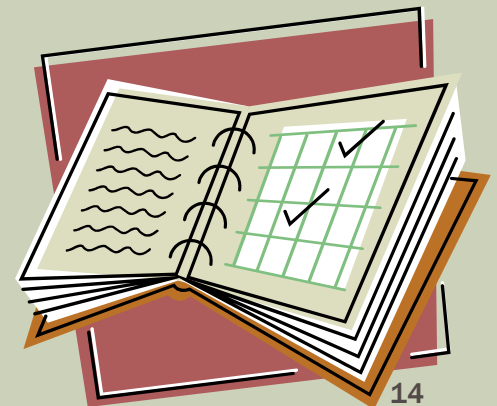


FUTURE WORK PLANS

- **Assembly & Programming
(Demonstration)**
- **Testing & Modeling**
- **Final Procurement**

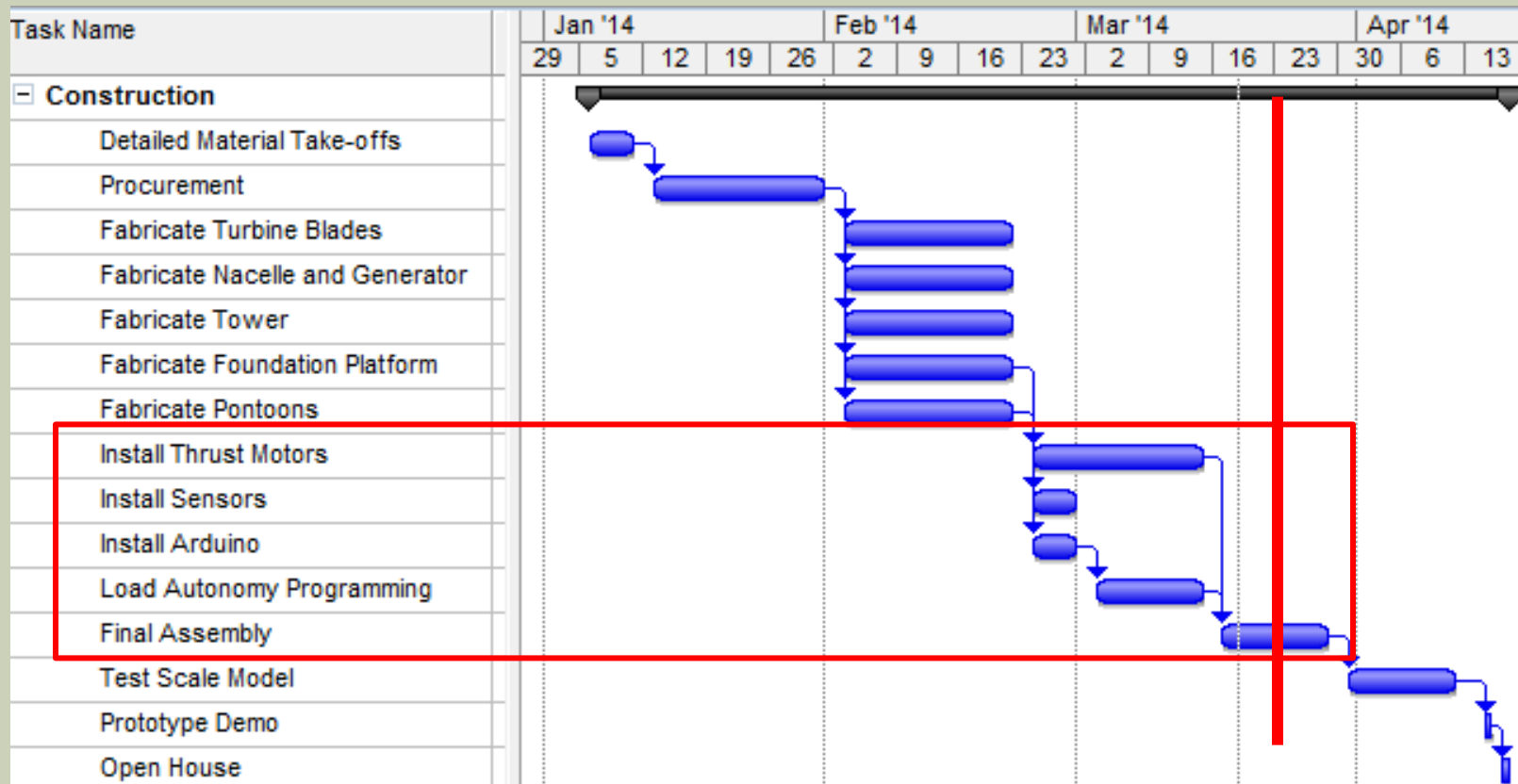
FUTURE WORK PLANS

- Overall on schedule
- Programming is almost complete
- Expected Construction completion



FUTURE WORK PLANS

- Schedule & Gantt Chart
 - On schedule
 - 95% Budget Allocated



THANK YOU

■ **QUESTIONS?**