

IPRO 350: Small Town Sustainable Economic Development



Orange, Massachusetts

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Statement of Problem

- **Economic demise of small town America**
 - Aging populations
 - Shuttered businesses
 - Deteriorating infrastructure
- **Purpose of the Orange-IIT partnership**
 - Reverse economic decline
 - Identify new business opportunities
 - Match local resources and human capital with IIT expertise

Our proposed opportunity

- Create a local business for the conversion of local farm waste and municipal sludge to saleable products such as Bio-Char



Benefits of Bio-Char

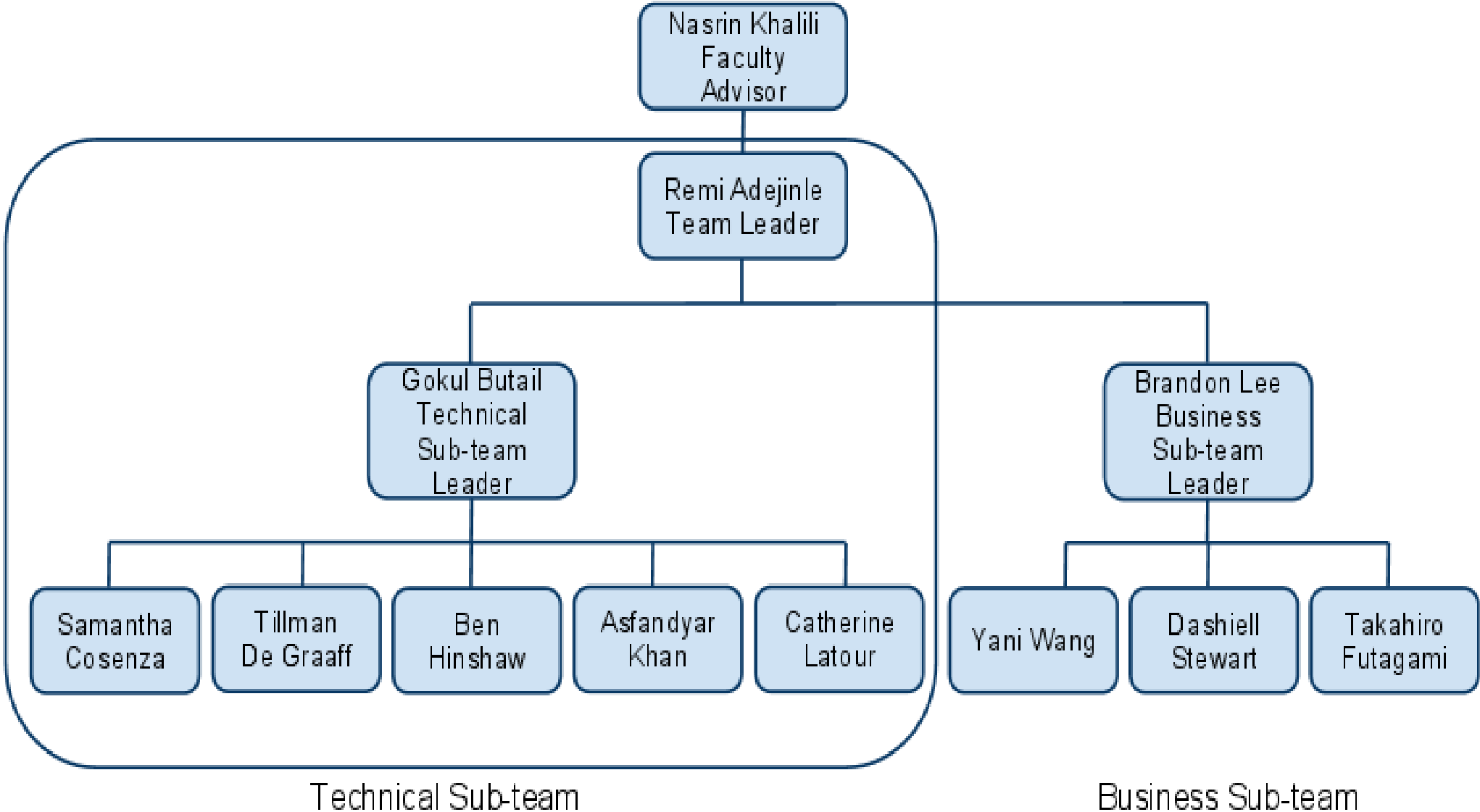


- Technology is simple: basic pyrolysis
- Bio-Char is an excellent soil amendment
- By-products include bio-fuel and heat
- Converts waste material, reducing disposal costs
- Sequesters carbon when returned to soil

Goals of the project

- **Design a model of a sustainable organic waste management system for rural areas**
 - Municipal Waste
 - Agricultural Waste --> Bio-Char
- **Develop a business case for Orange, Massachusetts**
 - Compare modular units and centralized facilities.
 - Evaluate Economic Impact of the designed system

Organization of Team



Progress Towards Goals

- Obtained information on waste sludge generated in Orange, MA.
- Analyzed waste management technologies and the Bio-Char option
- Created an initial design for our own kiln to produce Bio-Char at IIT.
- Visited Chip Energy to secure their assistance on our project.
- Outlined the pros and cons of alternative business models



Bio-Char

The Bio-Char kiln Design

Major Obstacles Encountered

- **Difficulty acquiring a pyrolysis unit**
- **Quality and availability of information**
 - Reliability of internet sources
 - Little precedent in real world solutions like this

Future Work and Challenges Ahead

- **Build a safe and efficient Bio-Char demonstration unit and test Orange materials**
- **Provide a solution for Orange sludge dewatering problem**
- **Obtain critical information from Orange on local waste materials (specifications and amount) for business case**

Questions?



Replace this picture with a picture of the grill Nasrin is buying from Chip Energy