

The Center for the Integration of Composites into Infrastructure

CICI

A National Science Foundation (NSF) Sponsored
Industry/University Cooperative Research Center (I/UCRC)

West Virginia University and
Rutgers, The State University of New Jersey

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October 22, 2008



West Virginia University®

RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

CICI - Industrial Recruitment Meeting

Vision:

To accelerate the adoption of polymer composites into infrastructure application through industry-wide cooperation

**Sponsored by: NSF I/UCRC Planning Grant
WVU-OSP**

Construction of
Molecular ERP
Elevated Roadway
Alternative - VI

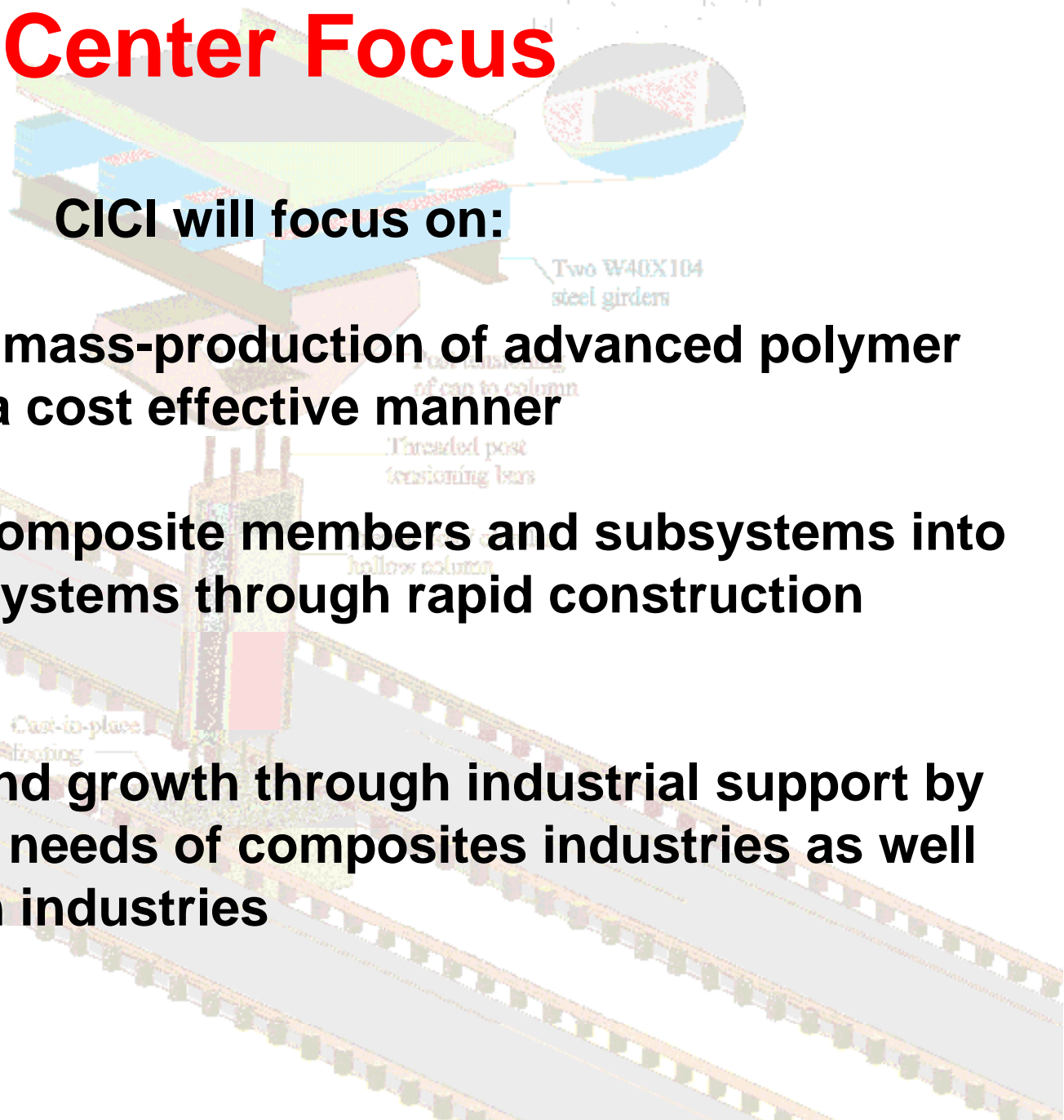
Center Focus

CICI will focus on:

Innovation and mass-production of advanced polymer composites in a cost effective manner

Integration of composite members and subsystems into infrastructure systems through rapid construction methods

Development and growth through industrial support by targeting at the needs of composites industries as well as construction industries



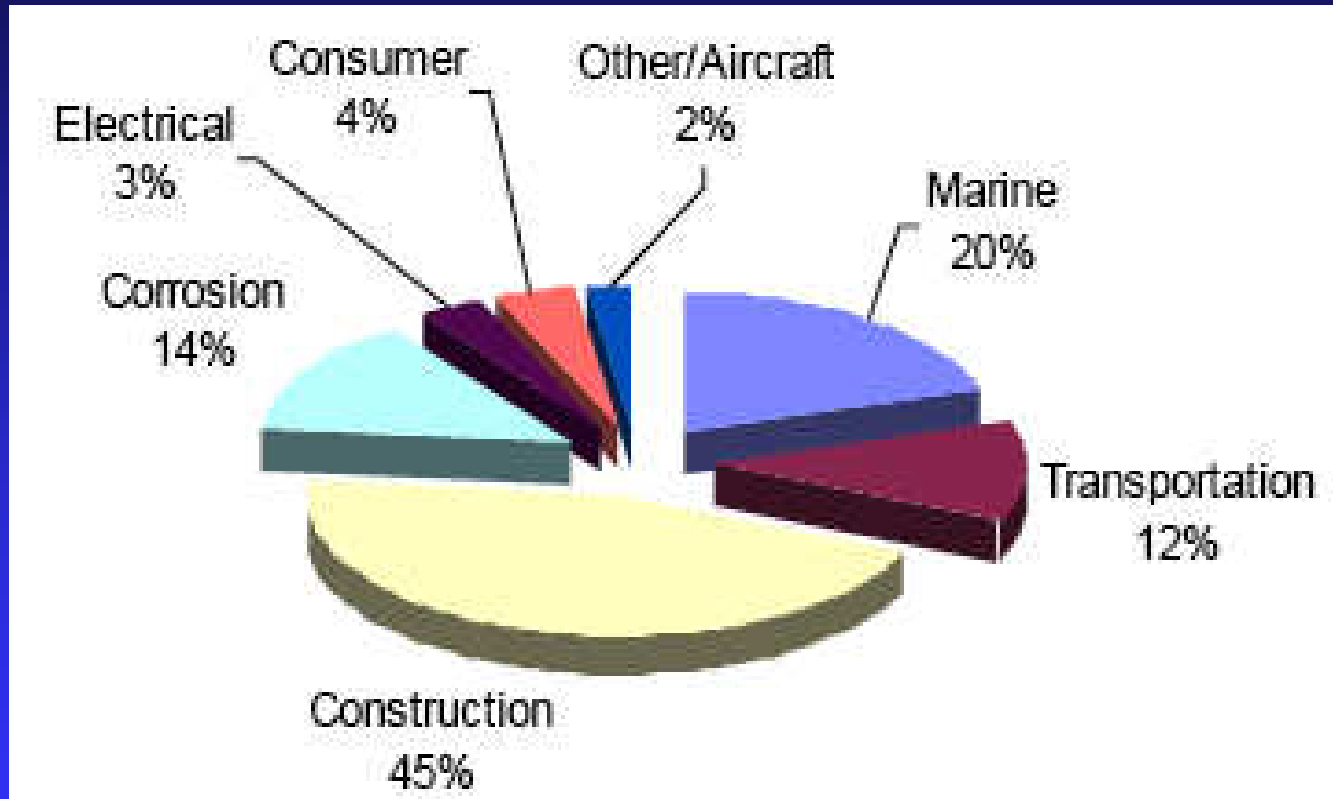
Approach

- 1. Host an industry and government recruitment meeting with emphasis on long term partnership**
 - **Fiber/fabric Manufacturers**
 - **Resin Supplies**
 - **Part Manufacturers (molders)**
 - **Designers**
 - **Contractors**
 - **R&D Groups**
 - **Educators**
 - **End-users (government and private)**
- 2. Develop R&D programs relevant to industry and end users**
- 3. Prepare and submit to NSF a full center proposal by March 2009**

Industrial Recruitment Effort

- **Elaborate CICI role with industry and government to expand use of composites in infrastructure**
- **Discuss specific research interests of industry and end users**
- **Explain/discuss Intellectual Property (IP) agreement**
- **Facilitate discussion on membership concerns**
- **Develop R&D agenda along with the needs of industry and end users**
- **Self-evaluate as per NSF I/UCRC requirements before developing center proposal**

Composite Application by End Use/Market Percentage



3.6 billion lbs. of US fiberglass thermoset composites shipments in 2007

Highway/Construction Industry

Market Potential-
Small



Market Potential-
Medium



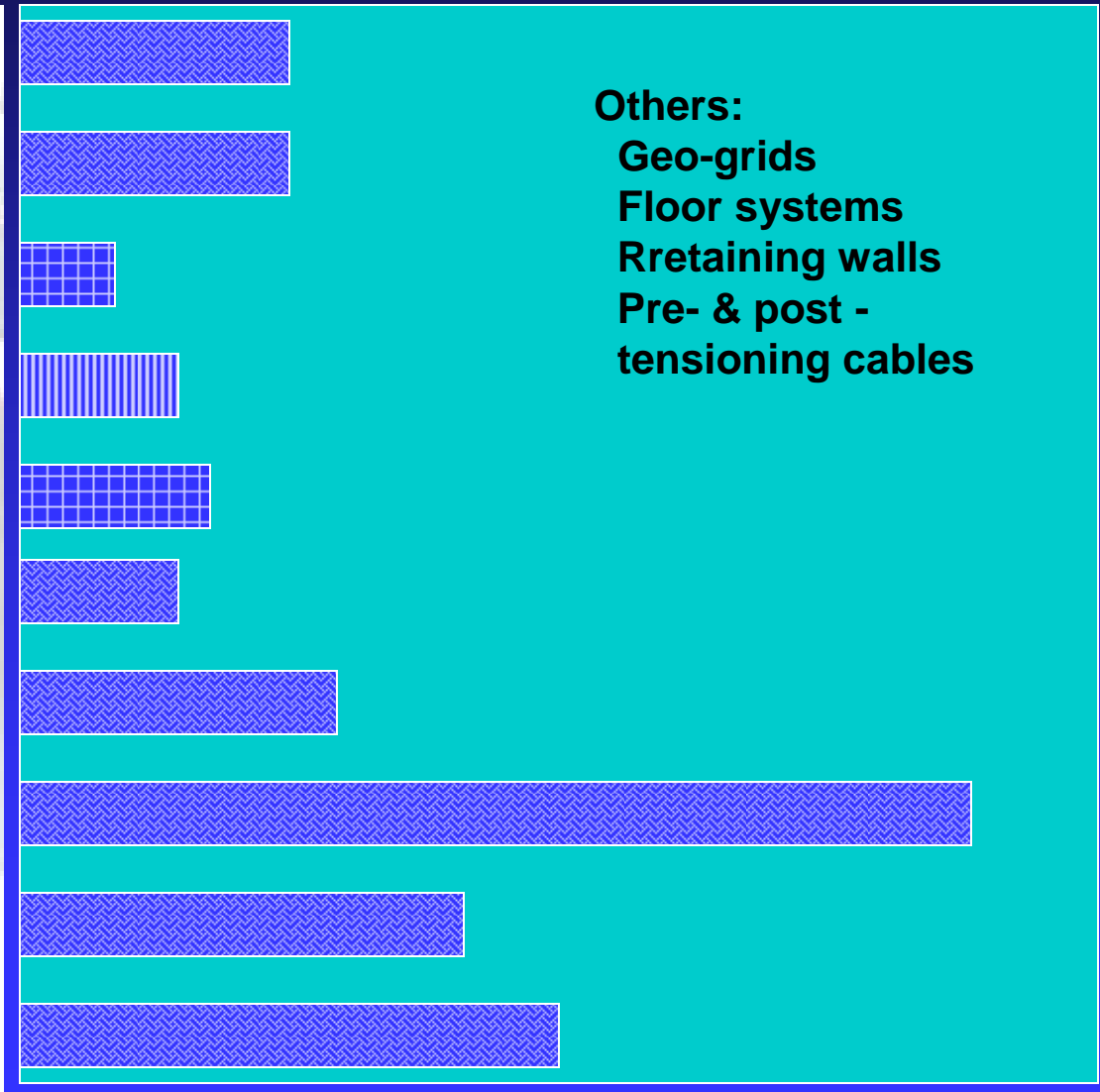
Market Potential-
Large



Easy

Difficulty Level

Difficult



Others:

- Geo-grids
- Floor systems
- Rretaining walls
- Pre- & post - tensioning cables



Power/Energy Industry

Market Potential-
Small



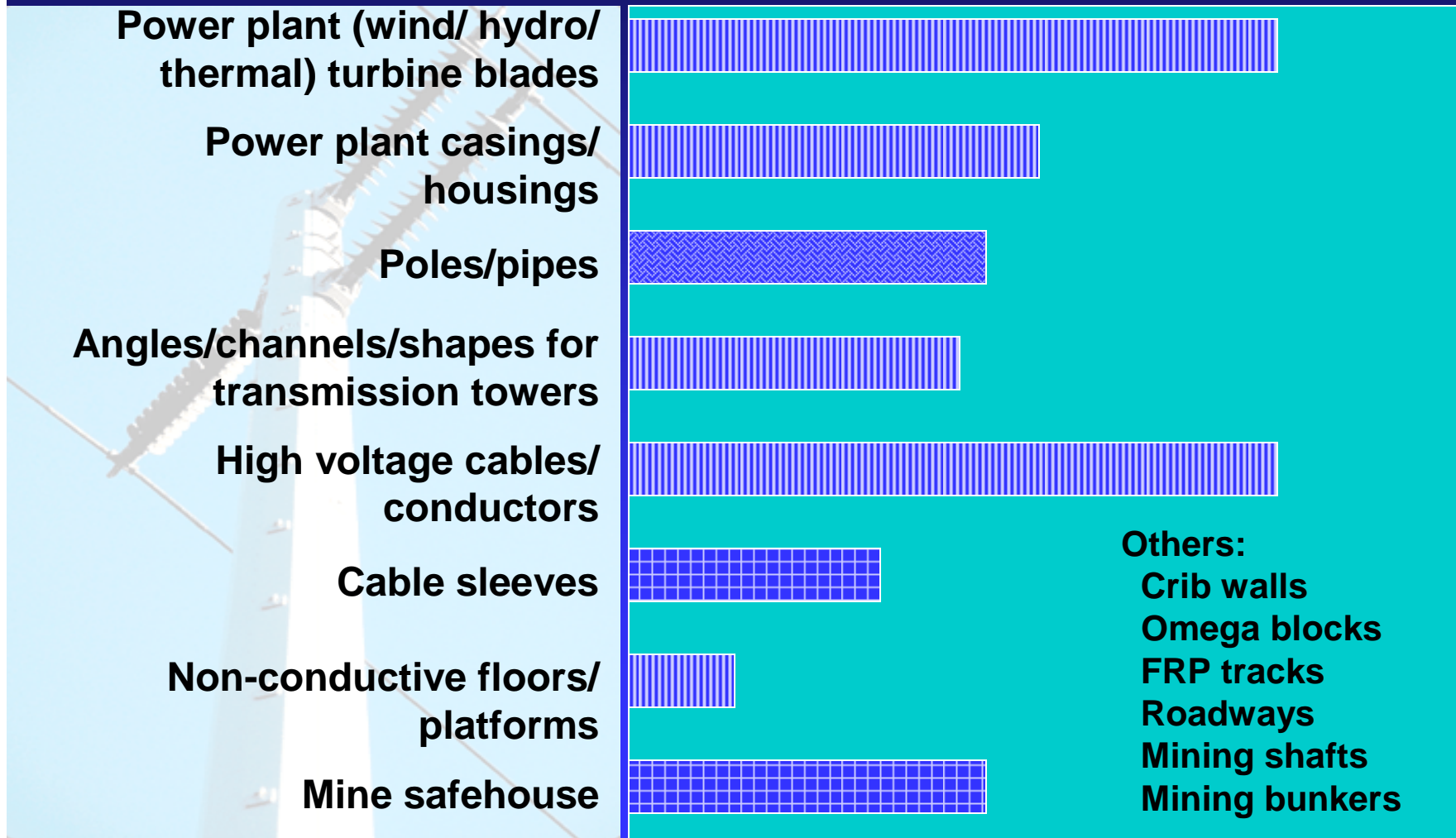
Market Potential-
Medium



Market Potential-
Large



Difficulty Level
Easy → Difficult



Defense Applications

Market Potential-
Small



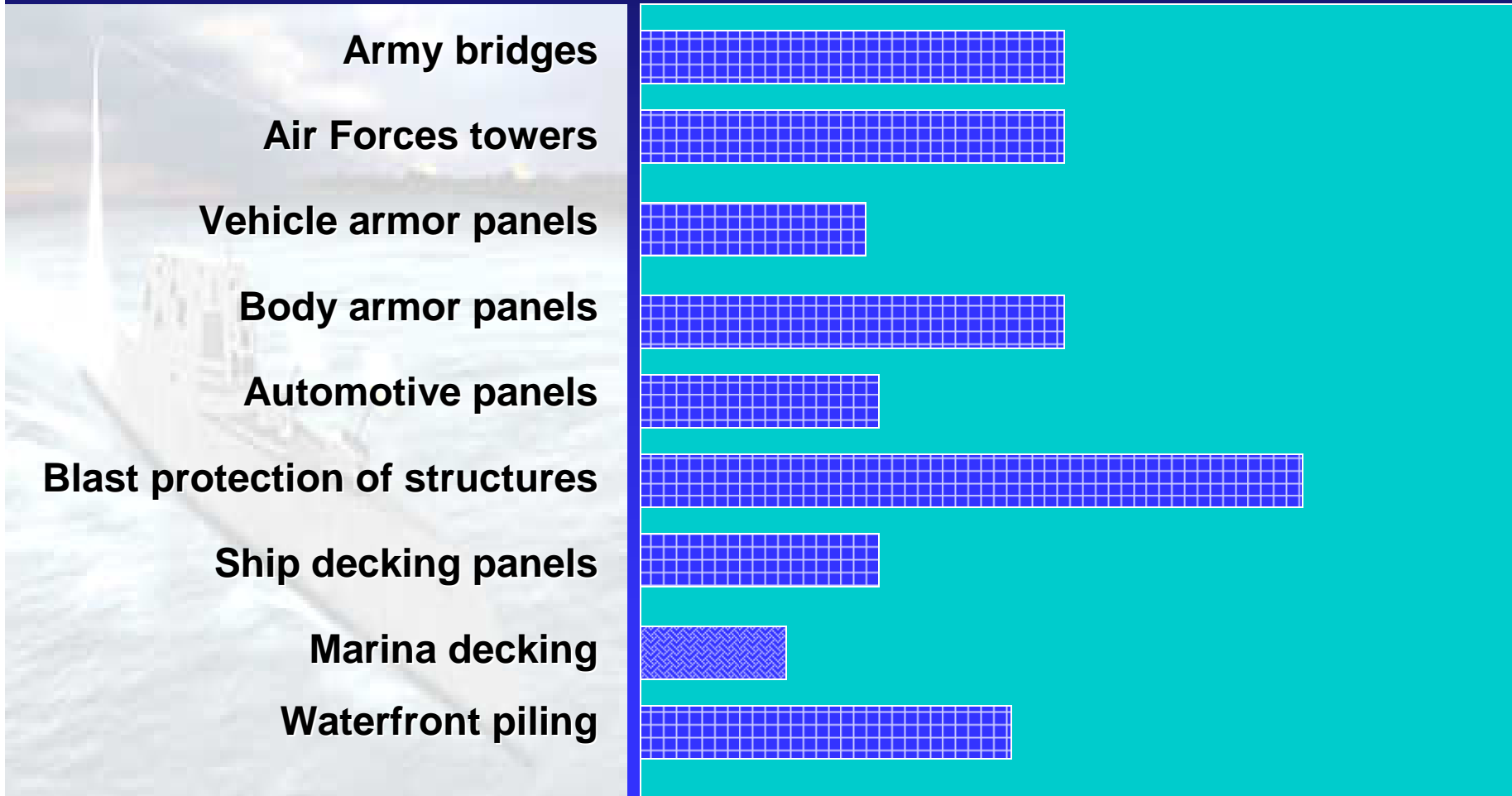
Market Potential-
Medium



Market Potential-
Large



Easy → Difficult Level



Potential Initial R&D Projects

- **Design, manufacture and implementation of panels (WVU)**
- **Resin design for fire safety and composite strengthening/retrofit of structural members (WVU& RU)**
- **Nondestructive evaluation of FRP composites using IRT and GPR techniques (WVU)**
- **Manufacture of hybrid organic/inorganic polymer FRP composites (RU & WVU)**
- **Self healing composites (RU & WVU)**
- **Wood polymer composites (WVU & RU)**
- **Educational modules development (WVU & RU)**

Additional Topics

- **Aging studies including strength and fatigue-life predictions (WVU)**
- **Rehabilitation of in-service structures and development of smart systems (RU & WVU)**
 - **Coatings as sensors/activators including nano additives**
 - **Self cleaning and de-polluting surfaces**
 - **Hybrid FRP systems with organic/inorganic matrices**
- **Innovative manufacturing and product optimization (WVU)**
- **Structural response of FRP members under combined bending, axial and other loads (WVU)**
- **Thermophysical properties (WVU & RU)**
- **Poles and posts (WVU)**
- **Products from recycled constituents (WVU & RU)**

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