Clean Energy Research Portfolio

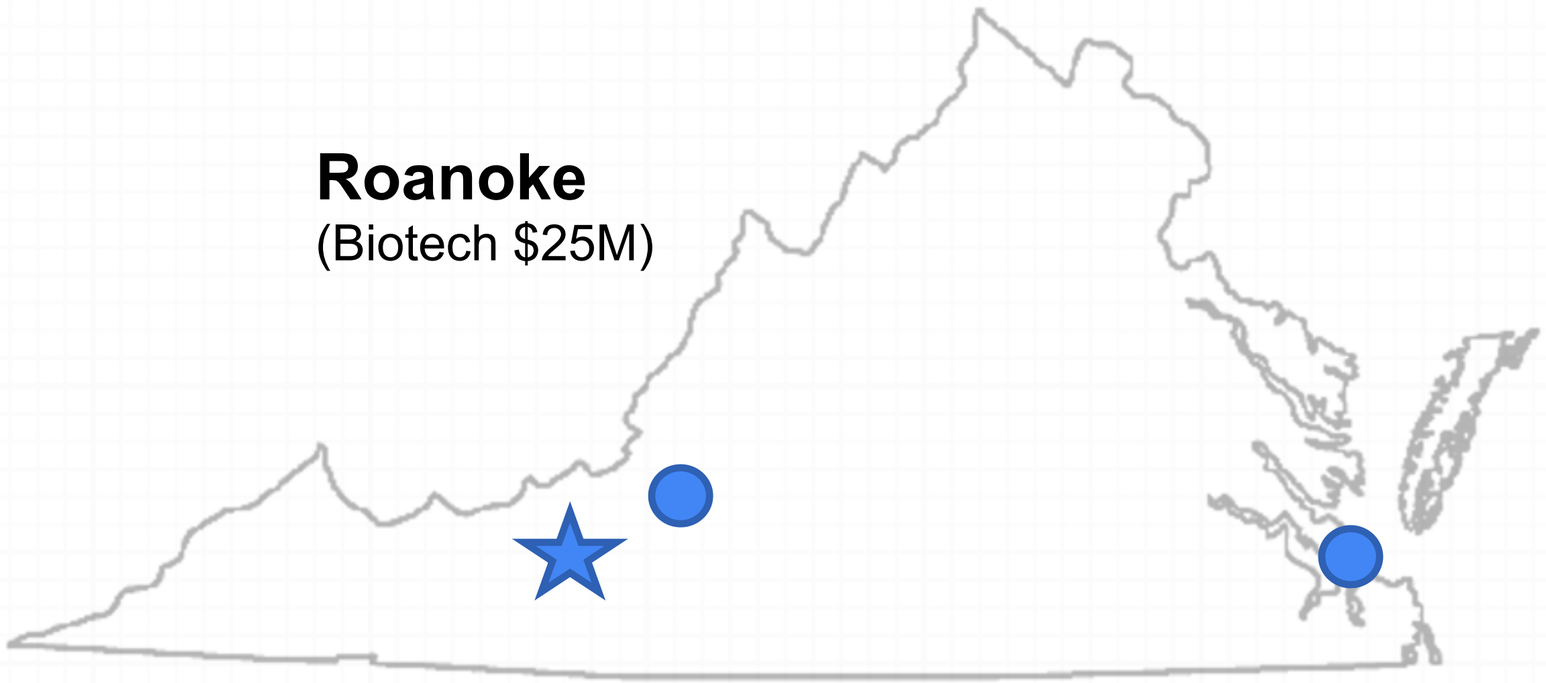
2023

VIRGINIA TECH®
Corporate Research Center

Technology Clusters

- Aerospace and Defense
- AV/EV Transportation
- Biotechnology
- Electronics and Sensors
- Materials
- Software
- University Research

Locations and Markets



Roanoke
(Biotech $25M)

Blacksburg
(Autonomous and Other $180M)

Hampton Roads
(Clean Energy $106M)

Hydrogen Technology Center

APPROACH: HAMPTON ROADS PROJECT TOUCHES ON ALL AREAS

Renewable Energy

Attract businesses with ESG goals/targets

Microgrids for reliability

Offshore Wind

Large amount of OSW connecting to the region

Natural Gas

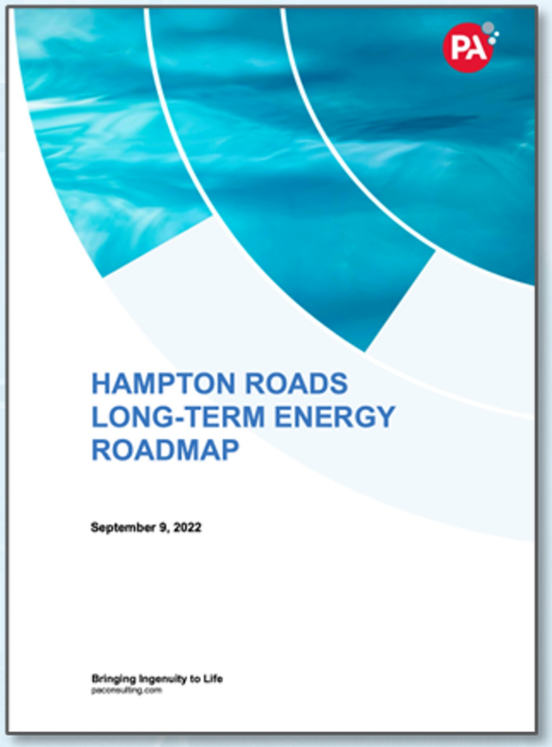
Balancing energy source for intermittent resources (bridge fuel)

Electrification

Heat pumps, EVs, Data Center related load

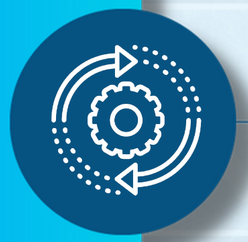
Emerging Technology

Hydrogen, Renewable natural gas, Vehicle to grid charging



GO Virginia Hydrogen Technology Center (Newport News)

1. INITIATE 3-5 HYDROGEN TRANSITION PROJECTS TO DRIVE LOCAL INDUSTRY INVESTMENTS



2. ESTABLISH A HYDROGEN COMPETENCY/DEMO CENTER TO EDUCATE AND ATTRACT NEW BUSINESS TO VIRGINIA

3. CREATE ADVANCED WORKFORCE AND TALENT PROGRAMS TO SUPPORT THE CLEAN ENERGY SECTOR

STATUS:

INDUSTRY SPONSORSHIPS IN DEVELOPMENT (MARINE, TRUCKING, AVIATION, INDUSTRIAL)

HTC DESIGN UNDERWAY

BENCHMARKING AND DEMO INITIATIVES ARE UNDERWAY

PROGRAMS FOR INDUSTRY EDUCATION AND WORKFORCE TRAINING UNDERWAY

CONSORTIUM GROUPS IN DEVELOPMENT

Each use case includes full ecosystem partners:

- Production
- Logistics
- R&D
- Engine/FC vendors
- Components, and
- End users

HTC IS A STRATEGIC LOCATION ON THE PENINSULA

TECH CENTER RESEARCH PARK

U.S. DEPARTMENT OF ENERGY

Jefferson Lab

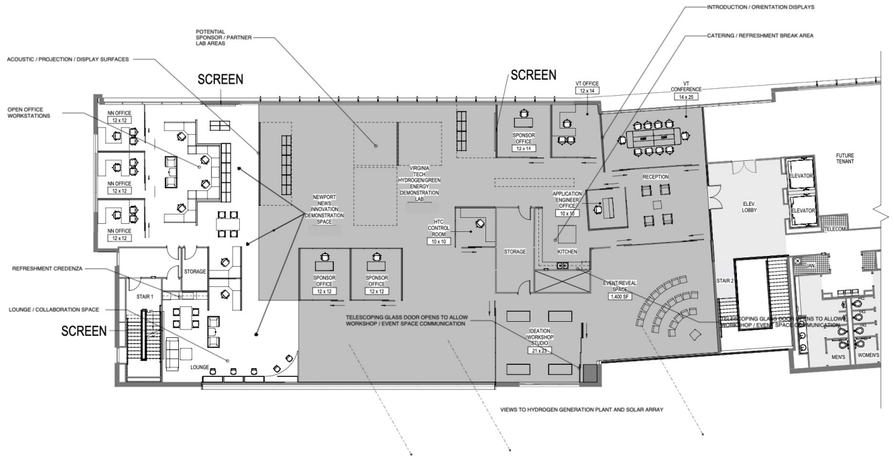
HTC

Newport News
Williamsburg Airport

TECH
CENTER
RESEARCH PAR

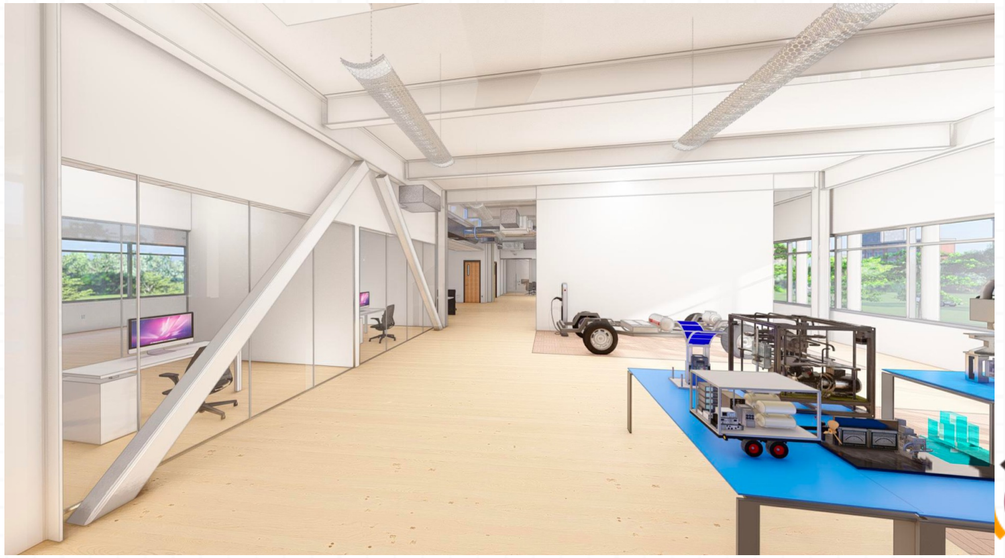
HTC Design

TECH CENTER RESEARCH PARK



VIRGINIA TECH SUITE: 7,690 SF / 9,074 SF RENTABLE AREA (CORE FACTOR 18%) - SHOWN SHADED
NEWPORT NEWS SUITE: 2,510 SF / 2,962 SF RENTABLE AREA (CORE FACTOR 18%)
TOTAL SUITE: 10,200 SF / 12,036 SF RENTABLE AREA (CORE FACTOR 18%)

GRAPHIC SCALE(S)

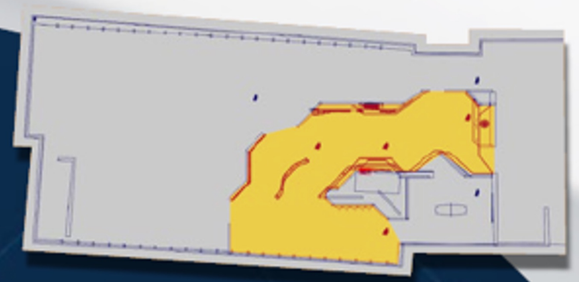


VIRGINIA TECH SUITE & NEWPORT NEWS SUITE
TECH CENTER II
NEWPORT NEWS, VIRGNIA 09/15/23

W.M. Jordan COMPANY

GuernseyTingle ARCHITECTURE | INTERIORS | PLANNING

Industry Education Center

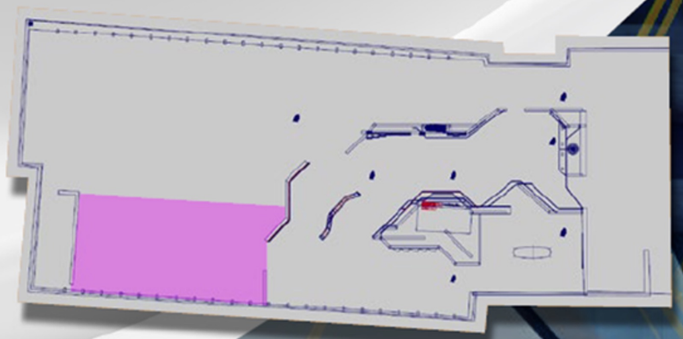


Education Center

A state of the art physical and AR education experience

- Energy Transition Story
- Community Education
  - Why decarbonize
  - What is Hydrogen
  - Why Hydrogen now
- Detailed Use cases
- Benchmarking

Industry Development Space



Technology Development Space

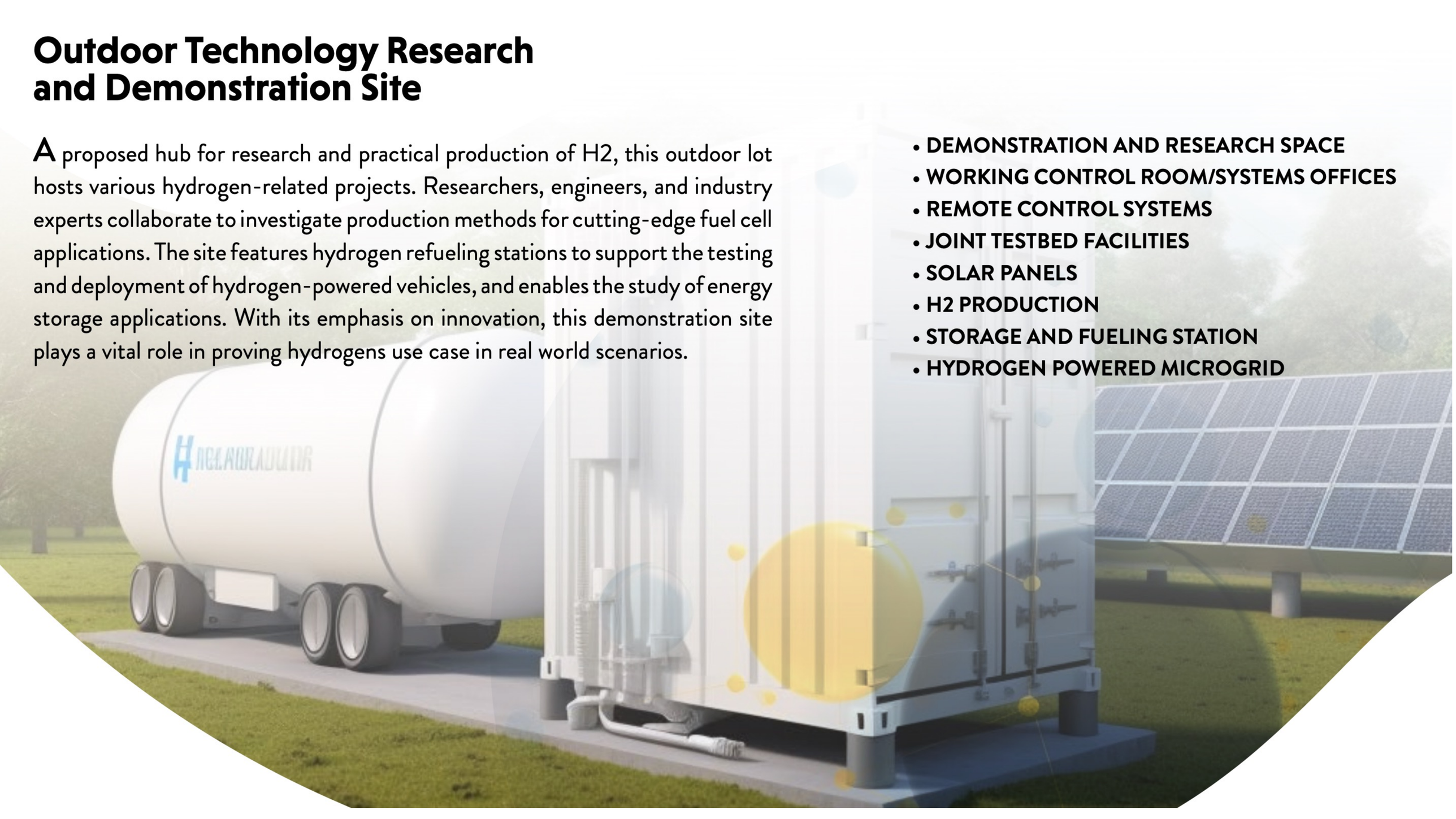
A flexible collaboration space

- Co-location
- Co-development
- Project Management
- Brainstorming
- Think tank
- Industry information repository

Outdoor Technology Research and Demonstration Site

A proposed hub for research and practical production of H2, this outdoor lot hosts various hydrogen-related projects. Researchers, engineers, and industry experts collaborate to investigate production methods for cutting-edge fuel cell applications. The site features hydrogen refueling stations to support the testing and deployment of hydrogen-powered vehicles, and enables the study of energy storage applications. With its emphasis on innovation, this demonstration site plays a vital role in proving hydrogens use case in real world scenarios.

- **DEMONSTRATION AND RESEARCH SPACE**
- **WORKING CONTROL ROOM/SYSTEMS OFFICES**
- **REMOTE CONTROL SYSTEMS**
- **JOINT TESTBED FACILITIES**
- **SOLAR PANELS**
- **H2 PRODUCTION**
- **STORAGE AND FUELING STATION**
- **HYDROGEN POWERED MICROGRID**



DEMONSTRATE SCALABLE CAPACITY - DISTRIBUTED WHERE NEEDED

REVIEWING INFRASTRUCTURE IMPACT AND BEST FOOTPRINT IN THE REGION FOR DEPLOYMENT

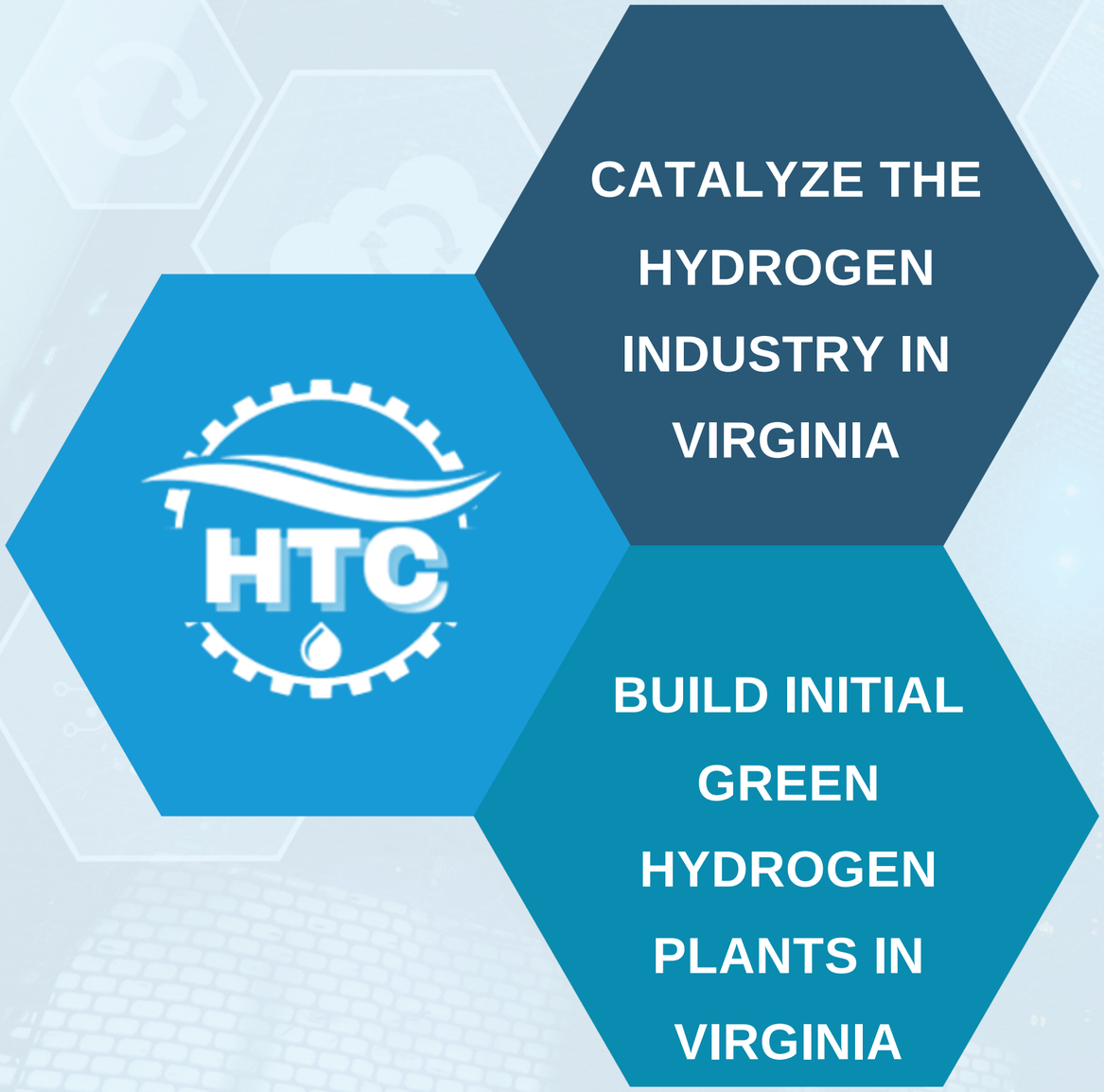
SITE 1

TECH CENTER RESEARCH PARK

THE PORT OF VIRGINIA®

VB

SUPPORTING TRANSITION



HTC will be the East Coast destination to:

- Learn / Research
- Collaborate
- Demonstrate hydrogen-based equipment

HTC SERVICES

- **Use Case Development**
- **Partnership Creation**
- **Internal Pitch Support**
- **Implementation blueprint**
- **Hydrogen Offtake**
- **Shipping/Storage**

The HTC ecosystem is designed to demonstrate projects and catalyze the industry by creating real world applications of hydrogen.