

# Phase II : Washington State Clean Energy Technology Strategy

## Strategy & Recommended Actions

6-25-10

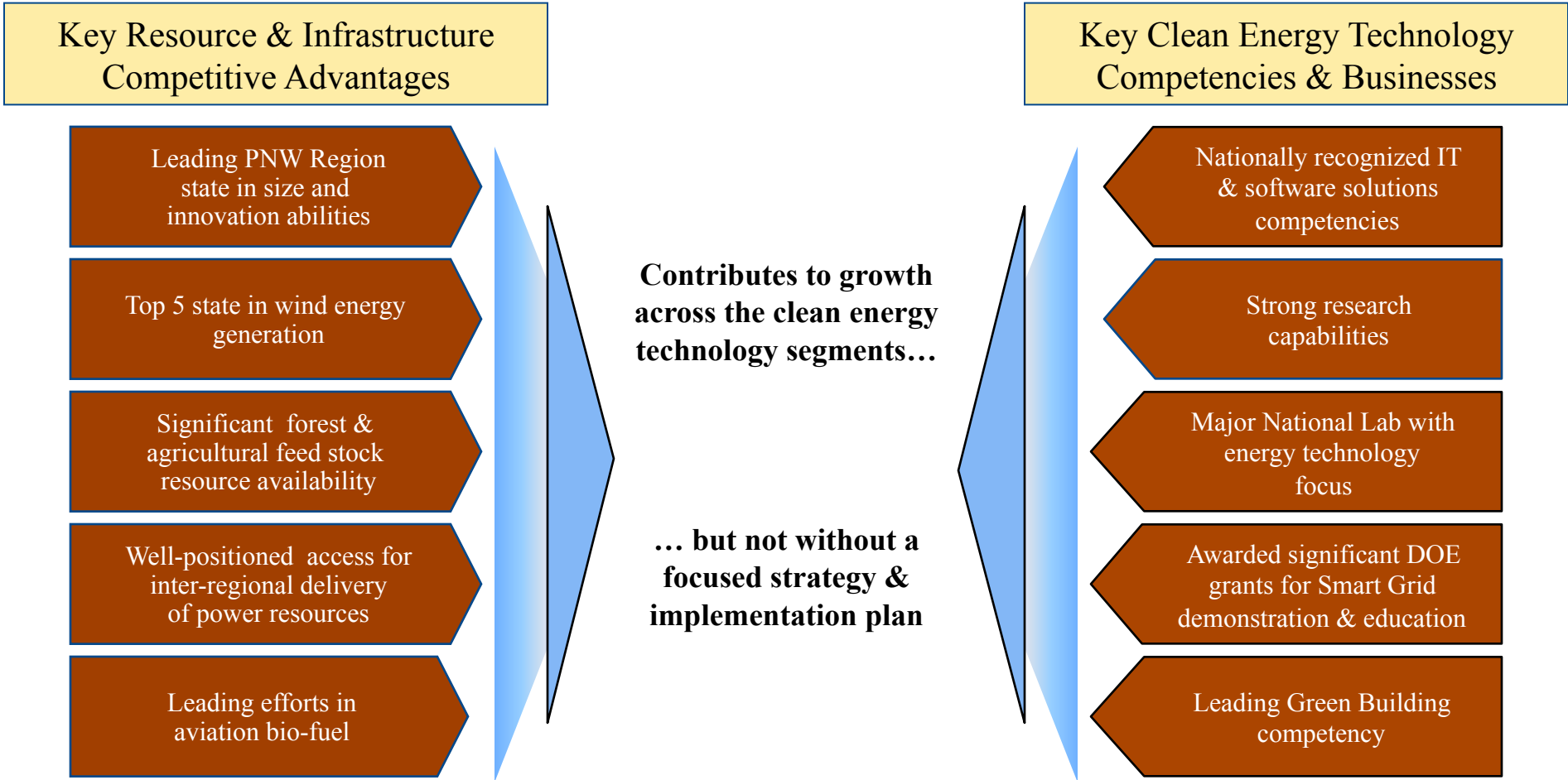


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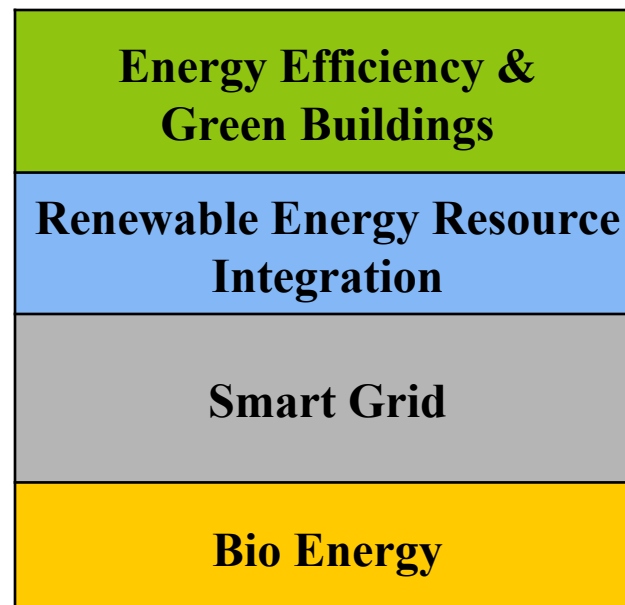
Focusing the Strategy >> Competitive Advantages That Can Be Leveraged

**Washington State has key competitive advantages and competencies which can be leveraged to foster clean energy technology growth and associated economic development**



## Focusing the Strategy >> Target Clean Energy Technology Segments

**Through two cycles of review of the clean energy technology markets, the Council has agreed to focus the strategic plan further on four areas:**



**Each of these areas benefit from the competitive advantages enjoyed by Washington state and are large present or expected future markets.**

## Focusing the Strategy >> Other Segments Warranting Further Separate Consideration

**Other clean energy technology segments are worthy of further pursuit, but not as part of this initial clean energy technology strategy**

### Nuclear Energy Technology

**Key Drivers:**

- Nuclear generation is being seriously reconsidered in US and continues development internationally
- Hanford has world class nuclear waste & other nuclear technology expertise

**Recommendation:**

- Review opportunities throughout the nuclear industry supply and value chain to assess, in detail, where Washington State can best apply its capabilities in the future of the nuclear industry

### High Efficiency Vehicles

**Key Drivers:**

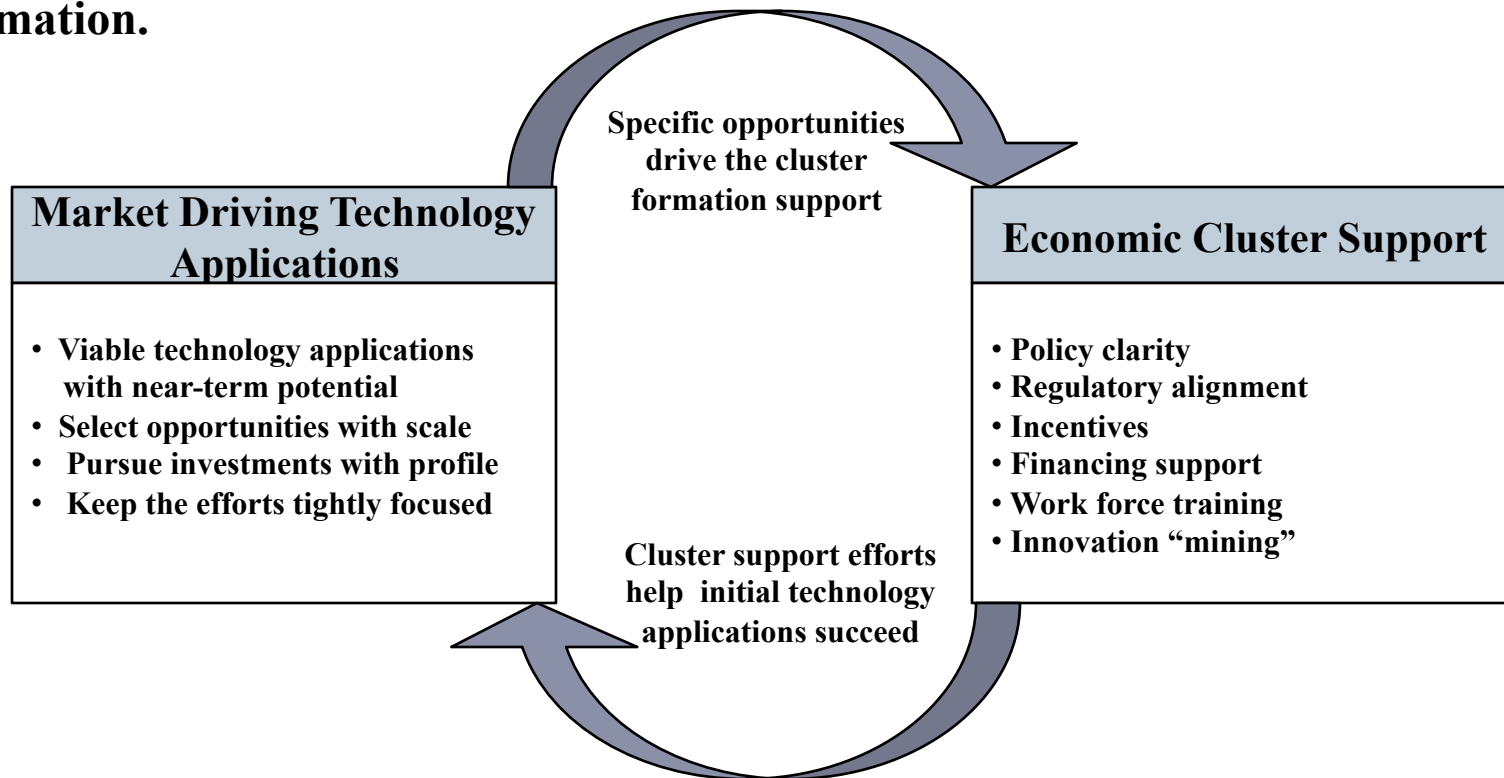
- High efficiency and electric vehicles have a large global market
- Washington has limited existing competitive advantages compared to the other clean energy technology target areas considered

**Recommendation:**

- Electric and high-efficiency vehicle economic development opportunities should be actively considered in Washington State as part of an efficient transportation strategy effort.

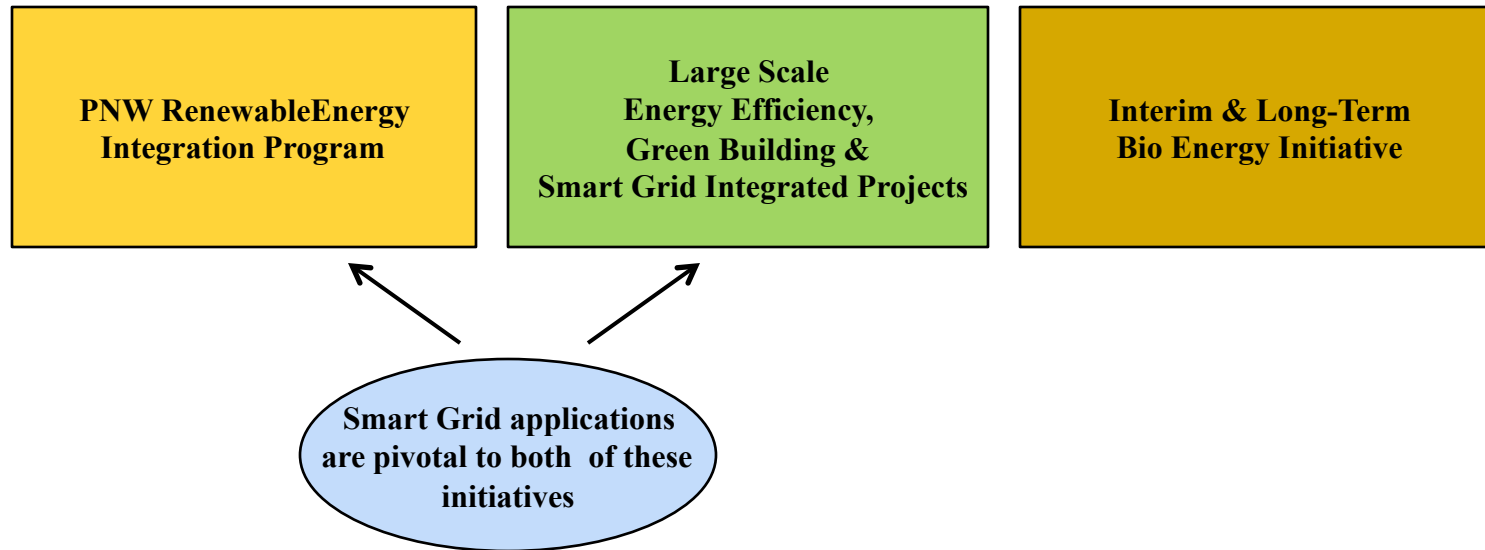
## Key Strategy Components >> Make a Market & Create Economic Cluster Support

**Strategy Focus: Pursue limited large scale clean energy technology opportunities in the most near-term promising segments to create the “pull” to build the support structure that enables clean energy technology cluster formation.**



## Market Driving Technology Initiatives >> Where to Start?

**Three focused areas of technology applications fit the criteria to help spark market interest in all four targeted clean energy technology segments**



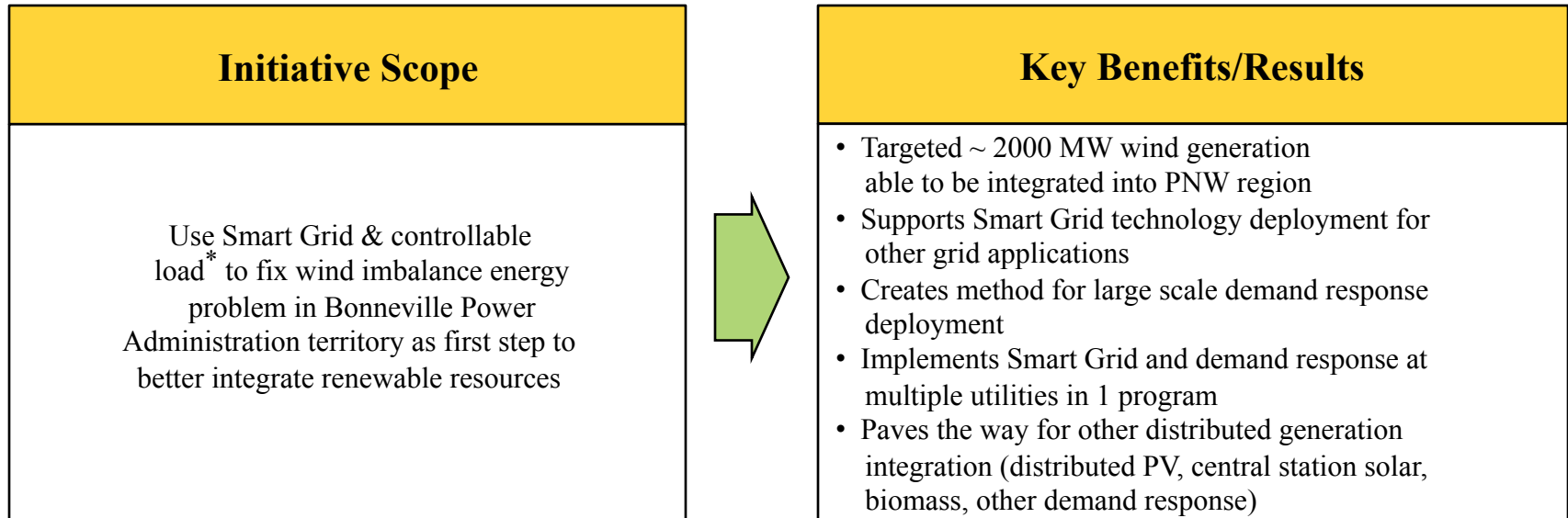
**The strategy for Washington needs to be focused to be successful due to the size of the state and the ability to compete. Each of the proposed initiatives meet these selection criteria.**

### **Criteria for Selection**

- Application fits 1 or more of the 4 target technology areas
- Washington has competitive advantage
- The technology application can move forward in 2-4 years at scale
- Success in the initiative will pave the way for more near-term clean energy technology opportunities and assist in longer-term technologies to advance more quickly

**Improved integration of wind energy through Smart Grid applications helps accelerate the integration of more distributed renewable energy resources in the region and beyond.**

**(1) Renewable Energy Resource Integration**



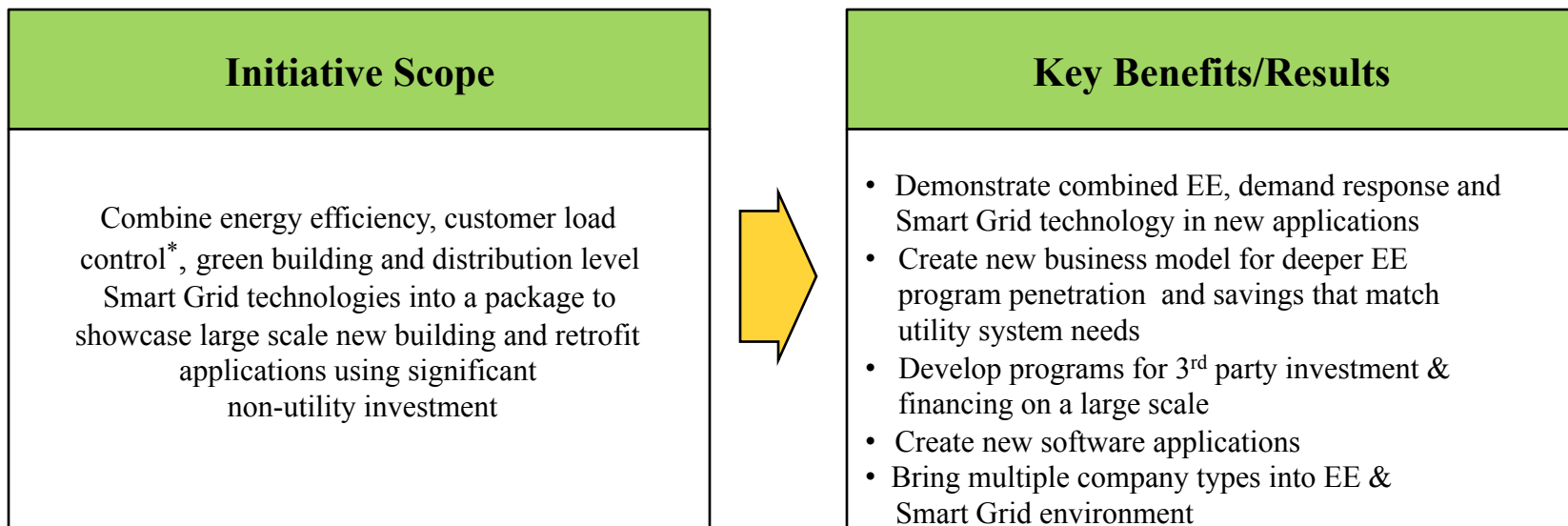
\* Controllable load = demand response

**Key Implementation Issues**

- Regional grid operation coordination
- Utility cost recovery
- Customer demand response incentives
- Smart Grid technology at grid and customer level

**Large scale projects to combine energy efficiency, green building and Smart Grid at scale in a new business model are a major market opportunity**

**(2) Energy Efficiency (EE), Green Building & Smart Grid Initiative**



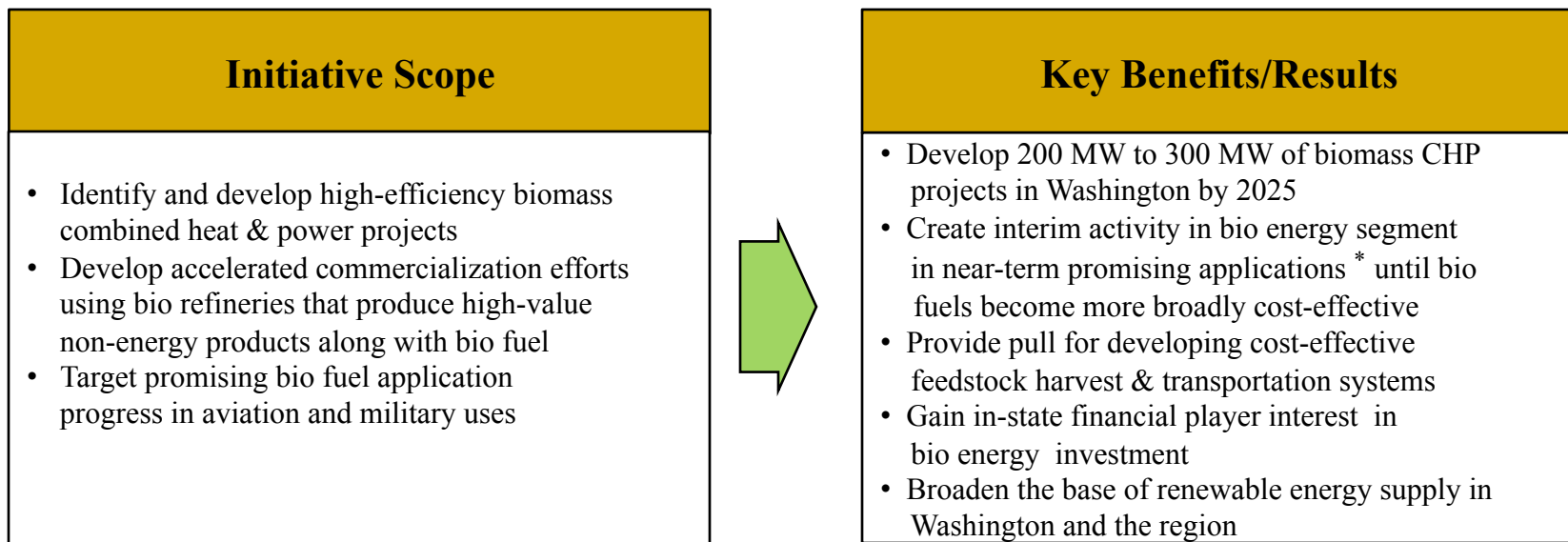
\* Demand response

**Key Implementation Issues**

- Utility cost recovery mechanisms
- Customer incentives
- Integrating building measures and devices with Smart Grid technologies
- Workable life-cycle financing structures for 3<sup>rd</sup> party investment

**Washington can advance bio energy by focusing on near-term project opportunities that support acceleration of longer-term bio fuel commercialization**

**(3) Bio Energy Initiative**



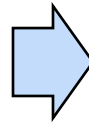
\* Aviation and military

**Key Implementation Issues**

- Facility siting/permitting acceleration
- Financial risk reduction mechanisms
- Create state/local government as customers
- Improve private party access to state bio fuel research facilities
- Prove cost-effectiveness for “drop-in” bio fuel for local aviation and military use

**The implementation of three technology initiatives directly benefits all 4 of the clean energy technology segments of interest to the Council.**

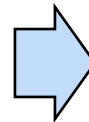
**(1) Renewable Energy Resource Integration Initiative**



**Target Segment Benefits**

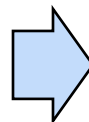
- Major Smart Grid applications
- Expands wind energy development in near term
- Benefits regional solar & other distributed generation development
- Strong demand response (EE-related) component

**(2) Energy Efficiency, Green Building & Smart Grid Initiative**



- Directly implements EE, Green Building, Smart Grid
- Aligns utility, customer and solution provider/investor interests for deeper savings, better results
- Strong demand response applications
- Potential solar resource implementation

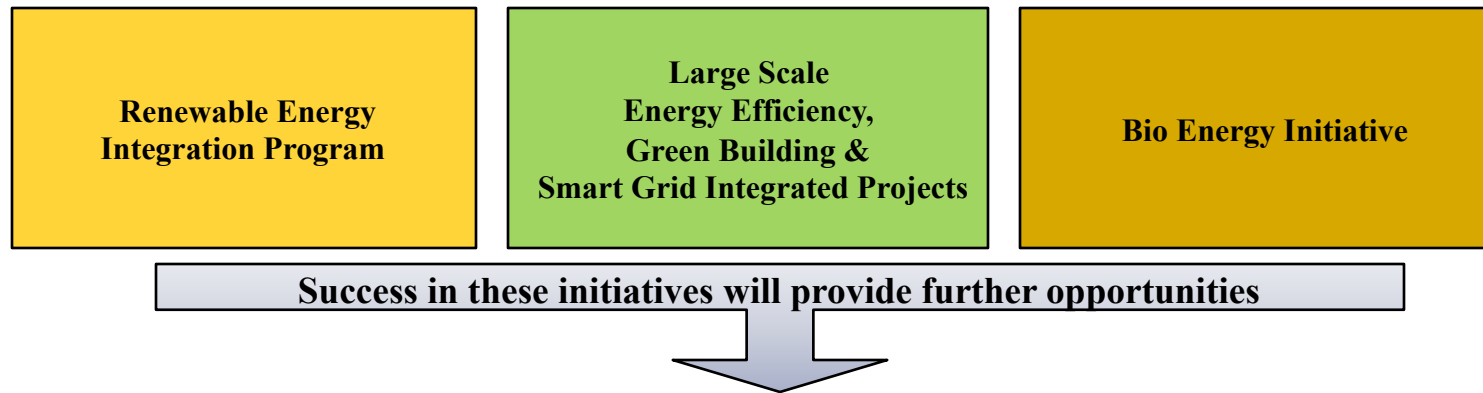
**(3) Bio Energy Initiative**



- Supports efficient bio fuel feed stock utilization
- Accelerates transition to bio fuel applications
- Provides early demonstration of most promising bio fuel applications
- Reinforces distributed renewable energy integration

Smart Grid is more readily implemented in combination with other clean energy technology initiatives to demonstrate its value.

**The initial three market driving initiatives help provide a foundation for additional clean energy technology economic development in Washington**



- Provide a foundation to attract new business to Washington clean energy technology solutions and services
- Enhance software-related products and services in-state to serve clean energy technology applications regionally and in global markets
- Increase the amount of investment and financing transaction support from Washington in clean energy technology in-state and beyond
- Expand interest in Washington-based research and innovation in clean energy technology
- Drive demand for greater work force training in clean energy technology

## Economic Cluster Support >> The Other Half of the Strategy

The first three Market Driving Initiatives provide momentum for attention to clean energy technology. To succeed, there are basic building blocks to the economic inputs in-state required to support economic cluster formation.

### Economic Cluster Support Components

- Leadership/Policy
- Innovation
- Finance
- Human Resources
- Marketing



## Economic Cluster Support >> Establish a Roadmap for Tangible Results

**Adoption of a partnering approach with tangible targets is key to achieving results. Clean energy technology will not advance quickly in Washington on its own.**

### Characteristics of Leading States in Clean Energy Technology Advancements & Development

- Larger population/economy than Washington
- Longer period of applied efforts at clean energy technology policy
- History of significant utility & retail customer funding of clean energy technology applications
- Successfully leveraged federal funding in clean energy
- Some with narrowly focused initiatives to concentrate efforts

### To overcome these comparative gaps, Washington needs to:

- Establish an efficient state-wide focus on clean energy technology policies and goals quickly
- Create confidence that policies and strategies will be sustained over time
- Leverage its attention and resources by partnering with active participants in the energy sector to focus on tangible results
- Focus its efforts on opportunities which achieve results quickly
- Develop a clean energy technology economic development platform to expand opportunities over time.

## Economic Cluster Support » Leadership & Focus

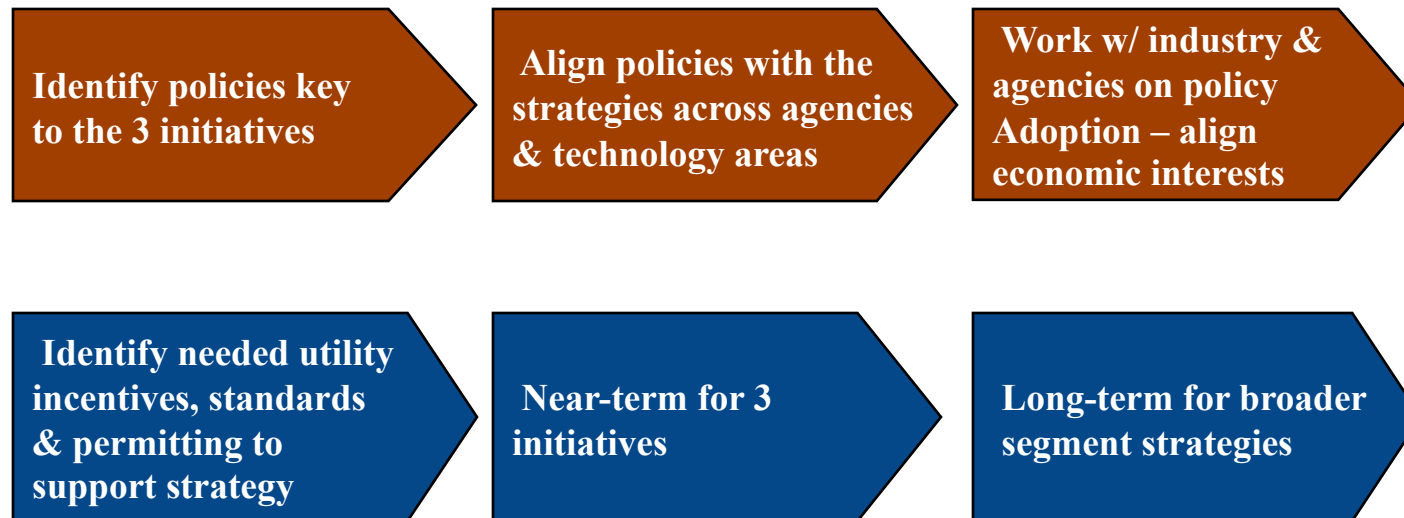
**Washington needs a single focus entity to lead clean energy technology strategy implementation. Some form of the CELC on a long-term basis is the key.**



**Supporting and sustaining economic cluster formation in clean energy technology requires actions in each of these areas**

## Economic Cluster Support » Policies & Regulation

**As a single point of focus, the CELC can help align policy and regulation in clean energy technology, coordinating with other relevant agencies & industry**

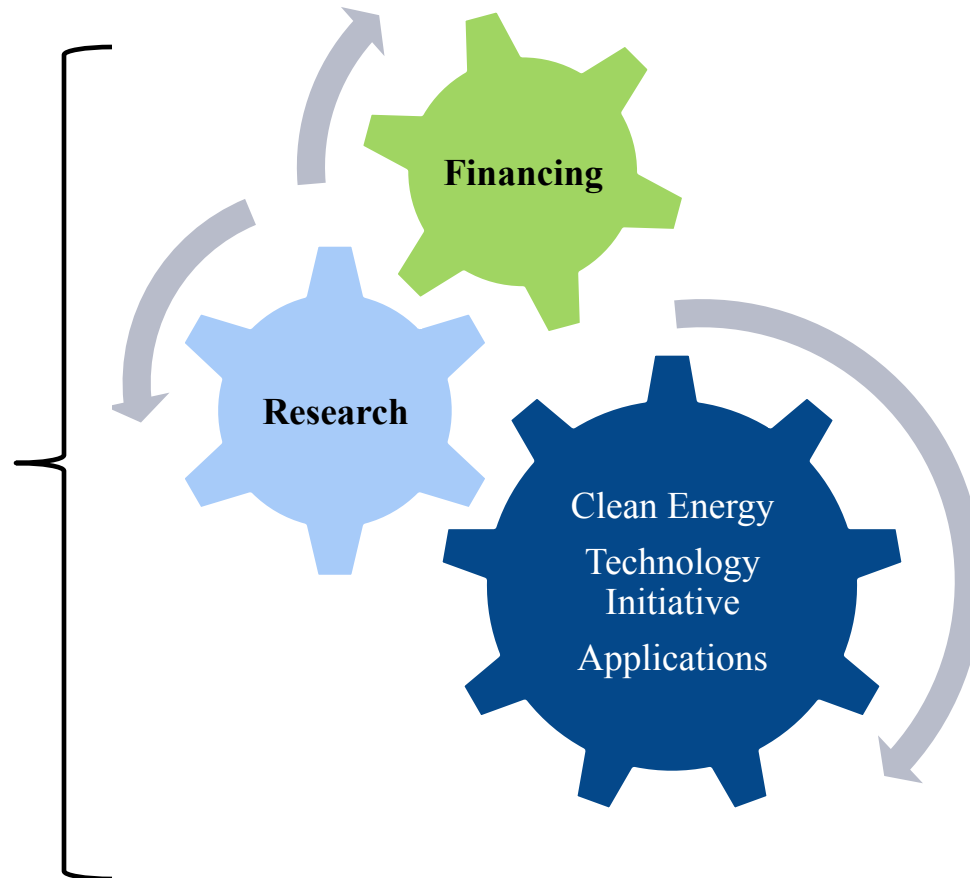


**Clean Energy Leadership Council role is facilitation & focus**

## Economic Cluster Support » Innovation

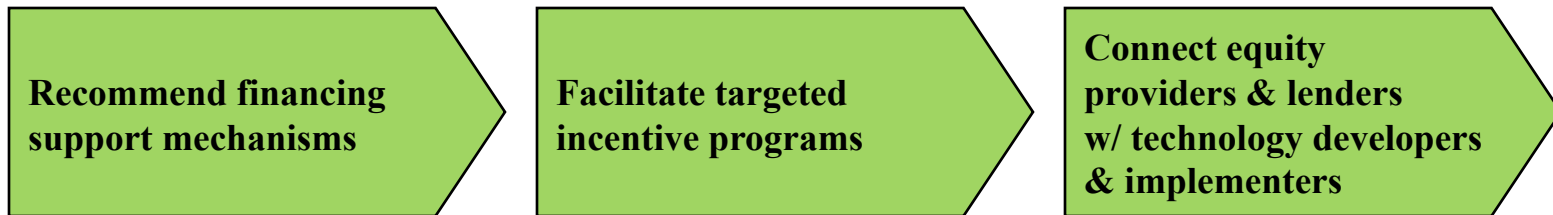
**Working with universities, industry, and in-state labs, clean energy technology research & innovation can be focused to meet nearer-term application needs**

**CELC helps facilitate industry, finance and research organizations to prioritize those research activities needed to provide solutions to clean energy technology solutions that have support & backing in Washington**



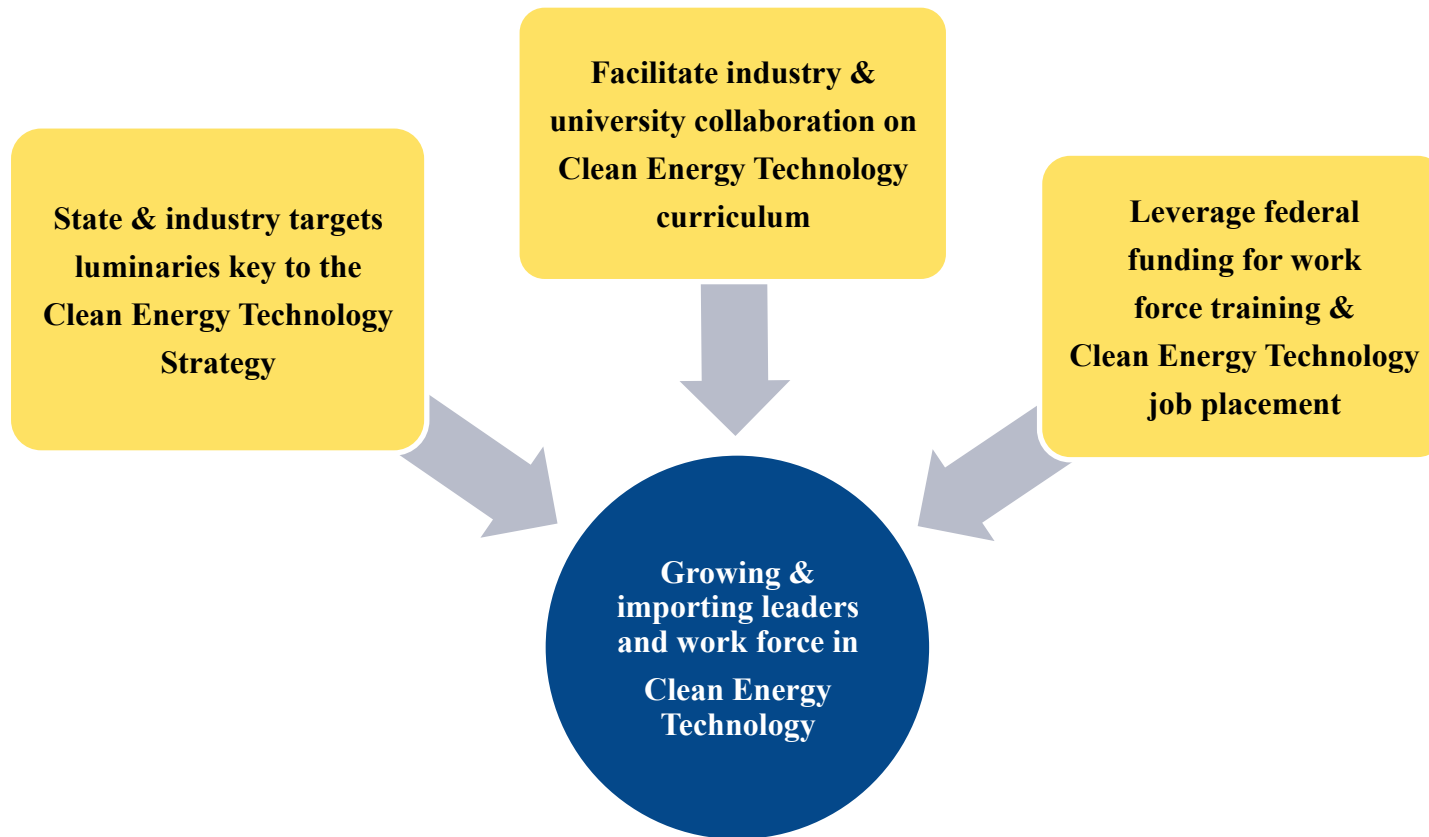
## Economic Cluster Support » Financing

**Enhancing clean energy technology financial viability and in-state financial sector participation is a key required component of economic cluster support .**



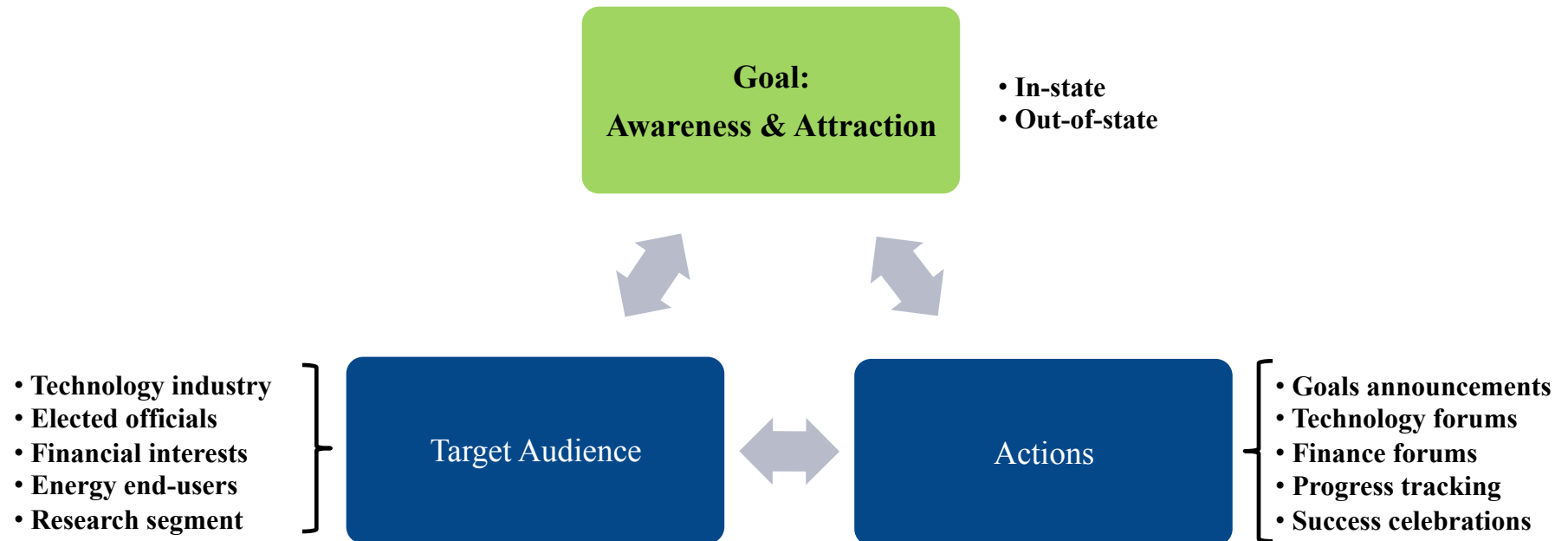
## Economic Cluster Support » Human Resources

**Attraction of technology luminaries and training of Washington work force in clean energy technology are key to the formation of economic clusters**



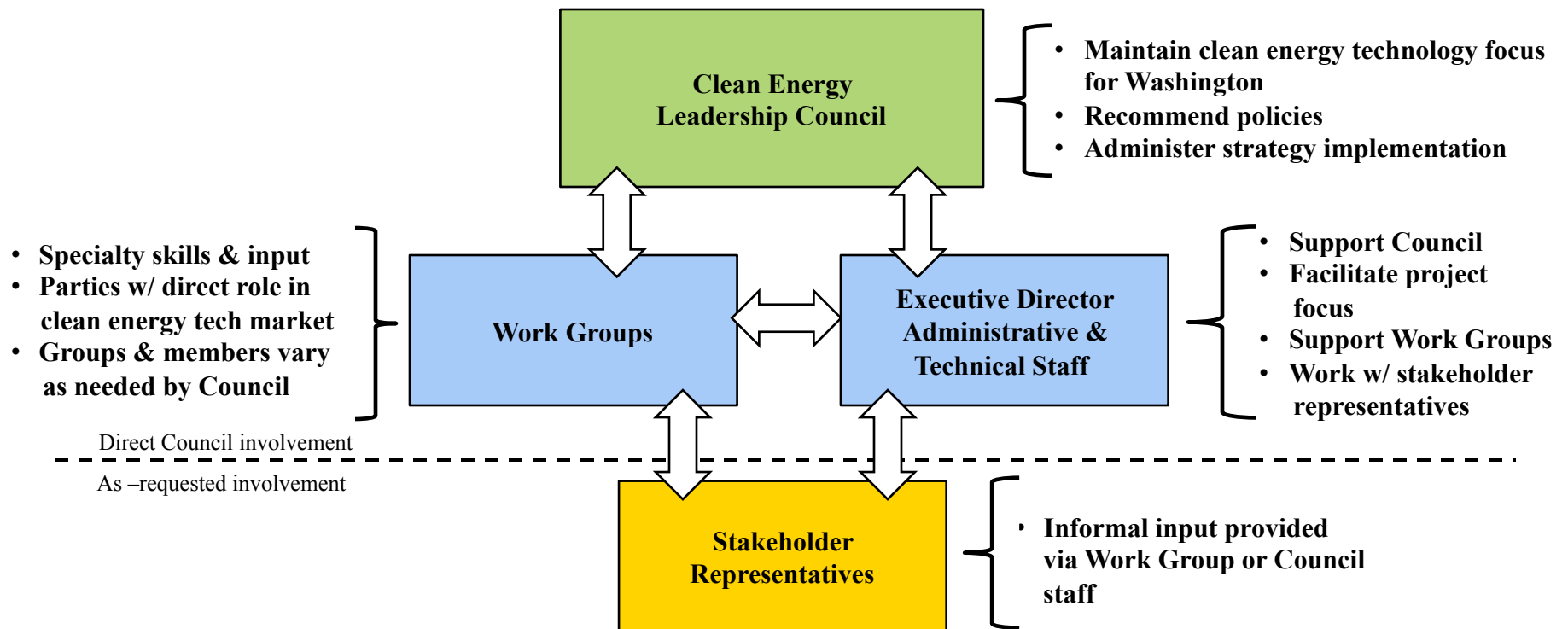
## Economic Cluster Support » Marketing the Clean Energy Technology Economy

**The CELC can be a focal point for marketing Washington’s goals, efforts and achievements in Clean Energy Technology – a key to sustained success**



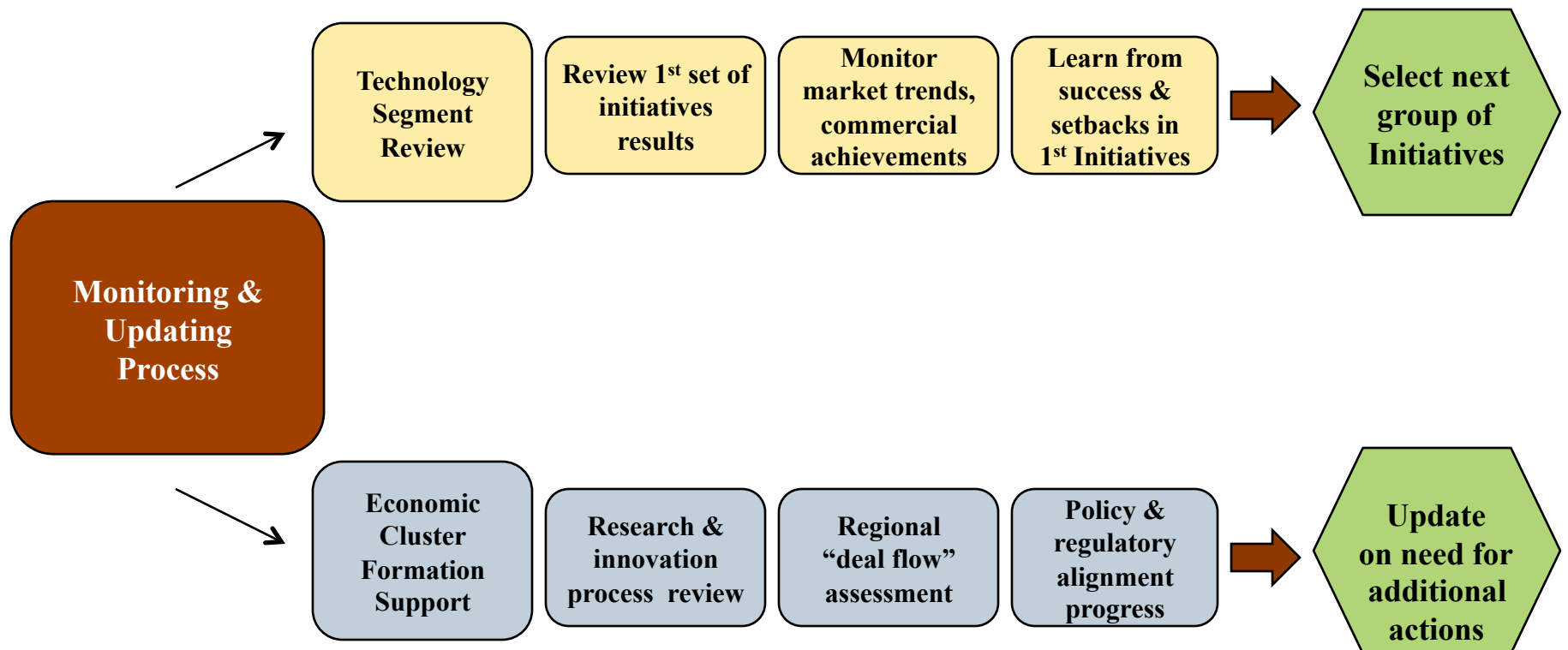
## Economic Cluster Support » Structure of a Long-Term Leadership Organization

**Creating and sustaining clean energy technology economic clusters requires a moderately funded leadership organization that bridges government and industry**



## Positioning for Future Opportunities >> Keeping the Strategy Updated & Active

The Market Driving Technology Initiatives recommended in this strategy are only an initial step. Creating and sustaining a Washington clean energy technology strategy is a long-term effort that requires review, renewal and expansion over time. Positioning for future opportunities is a key feature of the strategy.

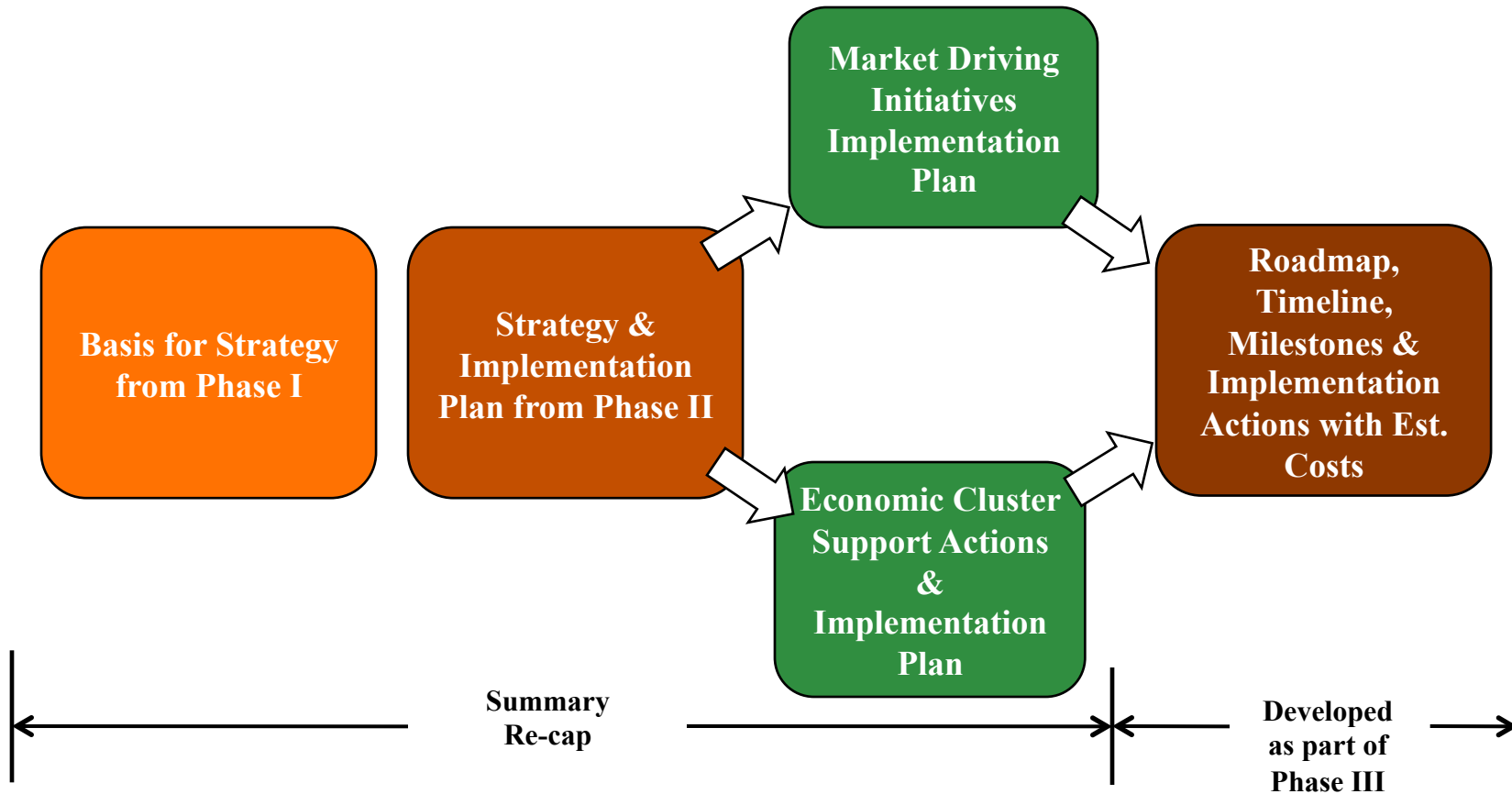


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## Next Steps for Phase III >> Overview

Phase III will be a “capping” report summarizing the strategy and providing a milestone – oriented timeline roadmap for the actions and anticipated results.



## Further Initiative Description >> Renewable Energy Integration

**Objective:** Use utility customer demand response programs to help resolve imbalance energy problems with wind energy in the PNW region.

**Scope:**

- Identify “controllable load” that can ramp up or down to match wind energy production
- Establish pricing structures to the value of that customer load control
- Create monitoring and control devices and software to control electric customer load on hourly basis
- Develop grid operations, power production, and utility customer protocols to allow electric load and wind production variability to match target levels
- Implement and monitor – prove the concept region-wide

**Near-term Benefits:**

- Helps develop incremental new wind energy resources in the region
- Demonstrates demand-response solutions to wind energy imbalance that can then be applied in other regions
- Enhance customer, utility, grid operator and regulator recognition of ability to integrate variable production resources like wind energy into the system

**Longer-term Benefits:**

- Enhance the ability to market renewable energy outside of Washington and the PNW region without burdening PNW region electric customers with associated resource integration costs
- Establish load control/demand response market pull for plug-in electric vehicles as part of grid solution
- Resolving wind energy integration challenges enhances future opportunity for solar energy generation implementation in the region
- Expanded wind and solar generation development in the region increases potential for related component manufacture and services in-state

## Further Initiative Description >> Energy Efficiency/Green Building/Smart Grid Demos

**Objective:** Use large-scale demonstration projects to achieve deeper savings to accelerate energy efficiency, green building and distribution-level Smart Grid at pioneering levels

**Scope:**

- Utilities, customers, building owners or developers, software and device developers collaborate to identify “signature” level EE/GB/Smart Grid projects with break-through savings levels
- Address human behavior issues which can limit EE/demand response effectiveness
- Develop utility investment, incentive programs and initial project cost-support structure to achieve target level of project implementation/funding
- Create more opportunity for non-utility investment in combined solutions
- Establish multi-year program with proper life-cycle cost recovery
- Include new buildings, “campus” environments, districts, retrofits and combinations
- Implement, monitor and share results

**Near-term Benefits:**

- Demonstrate combination of measures, technologies, applications and Smart Grid monitoring in manner not previously applied as large-scale proof of concept
- Use results to help define “cost-effective” measures & programs for future wider scale implementation
- Establish Washington as a leader in the combined technology and financial solution to accelerate energy savings
- Demonstrate new applications for customer and distribution level Smart Grid applications

**Longer-term Benefits:**

- Accelerates “net zero energy building/district” adoption
- Reinforces broader clean energy technology success and reputation for Washington to provide solutions out of state

## Further Initiative Description >> Bio Energy

**Objective:** Advance commercially viable bio energy applications while accelerating research on longer-term commercialization of bio fuel conversion for broader application

**Scope:**

- Identify and develop high-efficiency combined heat and power biomass generation projects in “campus”, “district”, government facility and other locations with concentrated thermal energy loads
- Accelerate the commercialization of bio aviation fuel and military applications of bio fuel for transportation as “early adopter” applications
- Create programs, funding and private party access to State bio energy facilities to develop “bio refineries” which produce intermediate non-energy commodity products along with commodity fuel from bio feed stock

**Near-term Benefits:**

- Use high-efficiency biomass power generation in combined heat & power applications to advance cost-effective bio feedstock collection and transportation systems
- Resolve policy confusion on biomass power production to better enable fuel-efficient projects to proceed
- Focus near-term bio fuel commercialization efforts on most promising applications to accelerate opportunities
- Enable private parties to more readily partner with State research facilities to co-fund accelerated bio fuel refinery development

**Longer-term Benefits:**

- Improve prospects for Washington to be at forefront of bio transportation fuel commercialization
- Provide additional economic input to forest and agricultural operations from biomass/bio fuel applications
- Add depth to Washington’s clean energy technology competencies beyond the utility sector