

Clean Tech:

An Agenda for a Healthy Economy



What is Clean Tech?

Cleantech represents a diverse range of products, services, and processes, all intended to:

- * Provide superior performance at lower costs, while**
- * Greatly reducing or eliminating negative ecological impact, at the same time as**
- * Improving the productive and responsible use of natural resources**

Source: The Cleantech Group, www.cleantech.com



Cleantech spans many industries and is defined by the following eleven segments. The Cleantech Group continues to refine criteria to ensure consistent reporting of data in the global markets it tracks.

Energy Generation

- * Wind
- * Solar
- * Hydro/Marine
- * Biofuels
- * Geothermal
- * Other

Energy Storage

- * Fuel Cells
- * Advanced Batteries
- * Hybrid Systems

Energy Infrastructure

- * Management
- * Transmission

Energy Efficiency

- * Lighting
- * Buildings
- * Glass
- * Other

Water & Wastewater

- * Water Treatment
- * Water Conservation
- * Wastewater Treatment

Manufacturing/Industrial

- * Advanced Packaging
- * Monitoring & Control
- * Smart Production

Agriculture

- * Natural Pesticides
- * Land Management
- * Aquaculture

Recycling & Waste

- * Recycling
- * Waste Treatment

Transportation

- * Vehicles
- * Logistics
- * Structures
- * Fuels

Materials

- * Nano
- * Bio
- * Chemical
- * Other

Air & Environment

- * Cleanup/Safety
- * Emissions Control
- * Monitoring/Compliance
- * Trading & Offsets



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Goals

Identify clean tech industries in which Massachusetts is positioned to lead

Identify and create a Massachusetts Clean Tech identity around those industries that will help attract a range of R&D, investment, jobs and other economic activity

Create an Agenda to make Massachusetts a clean tech leader through policies, investments, partnership building, market development, and other measures

Characterize the environmental, health, economic and job benefits

Develop a broad base of partnerships and support for building a clean tech economy



Phase I



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Massachusetts has leadership in five areas of clean tech

Clean Energy: the use of cleaner sources and generation methods of energy production that create less pollution, from fuel extraction through generation, as well as efficiency and conservation

Safer Alternatives: the design and use of safer alternatives to toxic chemicals in products and manufacturing processes

Green Buildings: products and services that reduce the health and environmental impacts of constructing, renovating, and operating building structures

Emerging Materials: such as bio and nano materials, which, when designed responsibly, have the ability to yield significant efficiencies in energy and materials use.

Materials Reuse: returning products and materials back into the economic mainstream through reuse, remanufacturing, composting, and recycling



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Technology-Specific Strengths

Clean Energy: large and growing 'clean' energy sector, policies in place to create demand...

Safer Alternatives: home to world renowned experts in Green Chemistry, TURA, key industries (wire and cable, electronics) complying with international toxics substances laws...

Green Buildings: high concentration of architects, builders, engineers, designers, 2 USGBC affiliates, new Zero Net Energy Building recommendations, MIT Building Technology Program...

Emerging Materials: top research institutions in bio- and nano-materials, key industries to adopt technologies, such as solar, pharma, electronics, medical; consistently high rankings as top nano center...

Materials Reuse: employment rivals clean energy sector, manufacturers turning 4 million TPY into new products, top plastics engineering center at UMass, research in textiles, rubber, organics, civil engineering...



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Other Massachusetts' Strengths

Manufacturing: specialized manufacturing still a large part of economy

Regulatory environment: Toxics Use Reduction Act, new energy and green jobs training laws, environmentally preferable purchasing

Innovation: colleges and universities, entrepreneurs, patents and licenses, business incorporations

Core technologies and key industry clusters: that can use and/or contribute to clean tech (software, pharmaceuticals, defense, post-secondary education)

Export ties: to Europe and Asia

Attraction of public and private investments: One of top states in attracting clean tech venture funding

High quality college and university research: that have yielded innovations, businesses, and patents in all areas of clean tech

Well-educated workforce: 2 out of 5 workers have BA; strong labor environmental awareness



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10 Ways to Support a Clean Tech Economy

- Create a Clear Vision and Goals
- Send a Strong Signal to the Marketplace
- Stimulate Collaboration
- Create a State Office of Clean Technology
- Develop a Trained Workforce
- Create a MA Clean Tech Brand/Identity
- Regulate, Procure, and Invest
- Don't be Afraid to Take Risks With Public Funds
- Promote All Clean Technologies in the State
- Encourage Cross Fertilization of Technologies



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Clean Energy

Help early stage companies test and adopt their technologies locally

Update state's Renewable Portfolio Standards to require higher fraction of generation to be renewable

Cultivate culture of experimentation by encouraging more university investment in research

Expand well-planned public transportation opportunities

Use more peer review to choose state-funded projects

Develop collaborations with other states



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Green Building

Sponsor research on costs and benefits

Encourage development of systems controls, software, and monitoring technologies for energy and indoor air quality

Market Massachusetts sustainably harvested wood as a brand

Create financial incentives to encourage investment in green buildings, and broad adoption of green building practices and products, such as carbon tax, differential insurance rates, property tax reductions

Develop training and certification program for contractors

Develop ways to affordably retrofit older, existing building stock



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Emerging Materials

Lead national discussion on defining what is “clean” or “cleaner” and define areas for such development

Fund research into identifying environmental and health benefits, hazards and risks throughout lifecycle and in different environments

Develop guidance on how and where to adopt advanced materials

Provide guidelines and training on how to manage environmental and health safety risks

Continue research and adoption on manufacturing these materials in a more environmentally benign way

Develop local and state ordinances that give companies clear direction on managing nano materials

Support development of monitoring technologies for nanomaterials

Promote collaboration with related sectors to find new applications



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Materials Reuse

Reinstate the Clean Environment Fund, or significantly increase recycling funding through other mechanism

Support research into new uses for scrap materials

Assist industries in incorporating recycled feedstocks

Increase diversion of paper from waste stream

Set standards and require certification of recycled content for state's Environmentally Preferable Purchasing program

Ensure that waste to energy technologies don't compete with recycling industry



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Safer Alternatives

Pass Safer Alternatives Bill

Educate all sectors about importance of safer alternatives

Develop specifications and regulations to help spur research, procurement, innovation, and technology adoption

Create program to underwrite costs of testing to help companies bring products to market

Assist companies in identifying safer alternatives to meet their specific needs

Expand Toxics Use Reduction model to other chemicals, businesses and products



Phase II and Next Steps....

