

Czech Republic

Czech Republic is host to growing opportunities in air pollution control and resource efficiency. However, EU standards and practices may inhibit U.S. companies' ability to bid successfully for environmental projects. Today, the overall environmental technologies market in the Czech Republic, including goods and services, is valued at \$1.24 Billion (2012).



The Czech Republic ranks 9th overall on the 2015 Top Markets Study (TMS) with a composite environmental technologies Score of 146.7. The Czech Republic's air market derives its ranking in the TMS with an air pollution control segment rank of 6th and a score of 111.5. The Czech Republic ranks 17th for water with a score of 31.5 and 23rd for waste and recycling with a score of 3.3 (See appendix A for global rankings).

STATE OF THE ENVIRONMENTAL REGIME

The Czech Republic's environmental regime has been rapidly improving since the mid-2000s. The Environmental Business Journal-OECD Environmental Stringency Survey, which ranks environmental regimes on a scale from 1 – 7 (with 1 being lax and 7 being among the most stringent in the world), scored the Czech Republic a 4.3 in 2012, a 1.7 point improvement

on its 2005 score of 2.6. Much of the Czech Republic's recent improvements are owed to its accession into the European Union (EU) and the need to meet EU environmental mandates.

MARKET BARRIERS

Market barriers in Czech Republic in general are associated with the differences in regulation and standards' development philosophies of the United States and the EU. The following barriers are most problematic for environmental technologies companies attempting to export to or work in the Czech Republic:

- 1. Failure to Recognize International Standards Used by U.S. Exporters:** Czech Republic, like all European Union countries, discretely

Figure 1: Czech Republic's Top Markets Scores

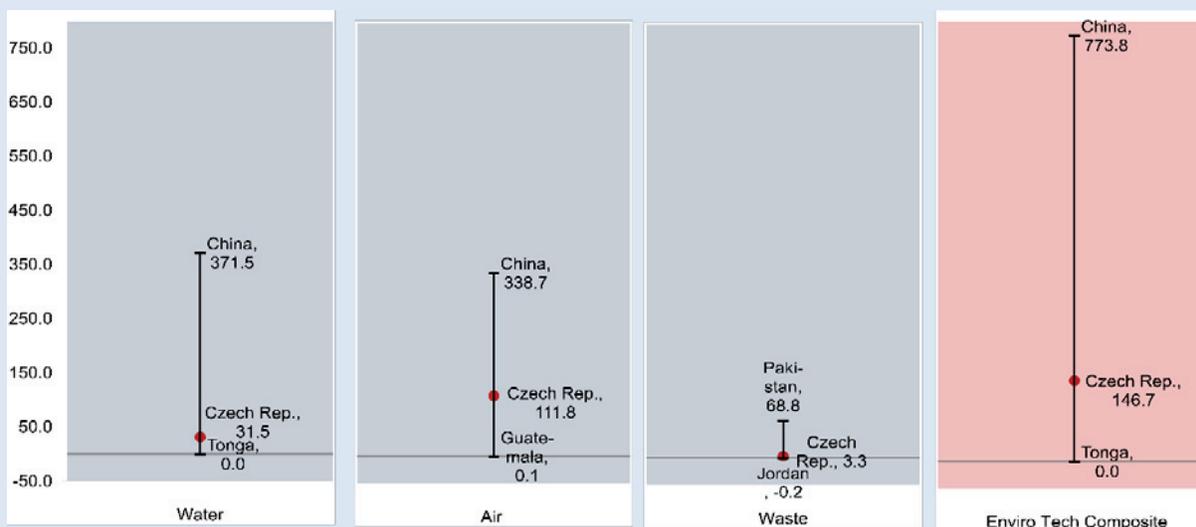
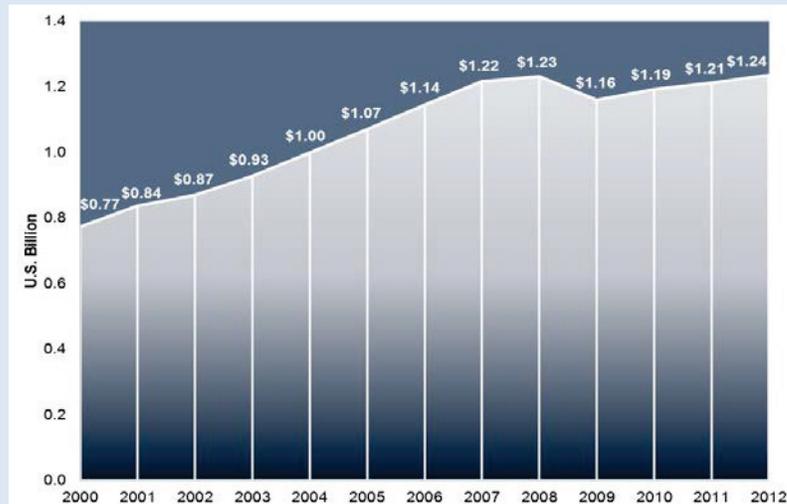


Figure 2: Czech Republic's Environmental Technologies Market



Source: Environmental Business International, 2013.

recognizes standards developed by the International Organization for Standardisation, the International Telecommunications Union, and the International Electrotechnical Commission. U.S. firms are unlikely to design their products to meet such standards since standards developed by these organizations are often design-based while those utilized by U.S. exporters tend to be performance-based. Although the standards U.S. exporters typically use are international standards developed by recognized international standards-setting bodies, these standards are often not recognized in Czech Republic, creating a barrier to U.S. exports.

1. A preference for design based standards over performance based standards.

In the United States, standards for environmental technology generally meet a performance threshold, such as mitigation of pollution below a level that the scientific method has determined is consistent with protection of human health. This performance-based approach allows for both innovation and a diversity of approaches to meet a specific goal. In the EU, many standards require technology to meet a design specification thus prohibiting use of any technology that meets the same performance standard but lacks the design specifications.

2. Application of the precautionary principle in standards and regulations.

In Europe the identification of hazards and subsequent limitations on application is tied to unknown future costs, as opposed to the risk-based approach which assesses the likelihood of both unknown and known risks against known benefits. Application of the precautionary principle in standards and regulations levies many billions of dollars on manufacturers and services providers for testing, and redesign without a clear definition of the resulting benefits. Furthermore, applying the precautionary principle to environmental technologies slows their delivery to market, even when the pollutant stream that is addressed poses greater harm to human health than the chemical or technology under evaluation.

3. EU assistance and subsidies for environmental projects.

In an effort to help the Czech Republic meet EU environmental standards, the EU often funds or subsidizes the development of environmental infrastructure. Within tenders there is a strong preference for European providers, placing U.S. bidders at a competitive disadvantage.

4. Lag in implementation of EU environmental rules.

Adoption of, and adherence to, EU environmental rules drives development of

environmental projects. The lag in adherence to EU mandates in this area has created a corresponding lag in the development and tendering of projects, thus slowing market growth overall.

MARKET OPPORTUNITIES

AIR POLLUTION CONTROL

Air Quality Monitoring

Air quality monitoring falls under the regulatory purview of the Ministry of Environment, while tendering and operation of air monitoring stations is the responsibility of local governments. The EU Energy and Climate Package will require the Czech Republic to further limit emissions, including those for Green House Gases (GHGs) and will require additional monitoring technologies at point sources before any trading scheme can be put in place. Commercial Service Prague reports that some of the best prospects in the air pollution control segment include technologies for air pollution monitoring, laboratory testing equipment, and software.

Technologies and Services in Demand:

- Continuous emissions monitoring systems
- Ambient air quality monitoring equipment
- Source emissions measurement technologies
- Analytical and laboratory testing goods and services
- Air pollution control equipment
- Fuel vapor control systems

Stationary Air Pollution Control

In its 2010 review, the IEA reports that the most polluted areas in the Czech Republic include the Moravian-Silesian, Central Bohemian, Olomoucký, and Ústecký regions. Much of the air pollution problems emanate from the Czech Republic's reliance on coal for energy generation and from household heaters that burn coal, wood, or pellets.^{cxxv}

Approximately two-thirds of energy comes from coal-fired power plants.^{cxxvi} While the Czech government is in compliance with the EU Large Combustion Plants Directive (LCPD) (2001/80/EC) which sets limits for sulfur dioxide, nitrous oxides, and particulates for plants larger than 50 Mega Watts (MW), opportunities remain for small combined heat and power (CHP) plants between 20 and 50MW^{cxxvii} under the National Emissions Reduction Plan (NERP). The EU Energy and

Climate Package will require the Czech Republic to further limit emissions including those for GHGs.

Technologies and Services in Demand:

- Wet/dry scrubbers (particularly systems that remove multiple pollutants)
- Carbon injection systems (for reduction in mercury and organics)
- Particulate matter control systems (particularly new bagging systems)
- NOx, mercury, CO2, and particulate matter monitoring and continuous monitoring systems
- Selective catalytic and non-catalytic reduction controls
- Oxygen enrichment, fuel injection, and other efficient combustion technologies
- Innovative specialty cements
- Mixing technologies
- Pumping and fluid handling equipment
- Engineering and plant design
- Leak detection
- Alternative fuel technologies used to fire cement kilns

WATER AND WASTEWATER TREATMENT

Municipal Water and Wastewater Treatment

Water resources and potable water standards in the Czech Republic fall in varying degrees to the Ministry of Environment, the Ministry of Agriculture, and the Ministry of Health, while the implementation of projects and management of resources falls to local governments. The EU Water Frame Work Directive worked to substantially modernize water infrastructure, which was paltry prior to the early 1990s.

The Czech Republic now hosts 2,100 water treatment plants, but much work remains in order to improve the provision of fresh water and reduce pollution levels.^{cxxviii} This is expected to be achieved through the development of a series of urban water treatment and conveyance projects in areas such as Prague and Brno.^{cxxix}

Water utilities also face the challenge of revenue shortfalls created by non-revenue water. In 2011 nearly 11.2 billion cubic meters of water, or 18.5 percent of total production, was lost or stolen.^{cxxx}

Tackling non-revenue water will generate demand for smart water, smart metering, and leak detection technologies to improve revenue collection and prevent losses during transmission.

Technologies and Services in Demand:

- Engineering, procurement, and construction services
- Advanced filtration
- Membrane filtration
- Waste to energy technology
- Anaerobic digestion
- Nitrification
- Biological denitrification
- Monitoring equipment
- Testing equipment

Process Water, Industrial Wastewater Treatment, and Water Reuse

Revisions of the Czech Republic's laws regulating industrial effluent have introduced widespread demand for industrial water treatment. Furthermore, the heavy reliance on coal for power generation coupled with coal mining will continue to promote the demand for water-for-energy treatment technologies and services. Beyond power generation, leading Czech industries that utilize both process and industrial wastewater technologies include the automotive industry, metals foundries, and heavy manufacturing.

Technologies and Services in Demand:

- Engineering and construction services
- Water reuse equipment and services (process specific)
- Advanced filtration
- Membrane filtration
- Reverse osmosis
- UV disinfection
- *Anaerobic digestion*
- Nitrification
- Biological denitrification
- Testing equipment

WASTE MANAGEMENT AND RECYCLING

Municipal Solid Waste and Recycling

Approximately 70 percent of municipal solid waste in the Czech Republic is landfilled.^{cxxxix} EU mandates will require that 50 percent of all wastes are recycled by 2020. In order to meet this requirement, the Czech Republic has implemented a landfill tax to balance the price differentials that currently favor landfilling over recycling. Waste incineration and waste-to-energy are an emerging area of need in the Czech Republic in order to meet EU waste reduction requirements.

A University of Brno study estimates that the capacity gap for waste incineration is approximately 1,500 KT annually.^{cxxxii} Impending legal requirements for municipal separation and treatment of biological wastes will drive demand for large scale composting technologies and waste piles. The capacity to employ advanced recycling methods in the Czech Republic is still developing, but the expected increase in recycling rates will provide opportunity for U.S. recycling equipment manufacturers and service providers if opportunities are open to non-European firms. Areas of focus for recycling include de-manufacturing of vehicles and recycling of lead batteries in addition to recycling consumer wastes.

Technologies and Services in Demand:

- Waste collection technologies
- Sanitary landfill systems
- Environmental monitoring and analytical equipment
- Sorting machines
- Crushing and grinding machines
- Materials handling equipment
- Collection services, containers, and vehicles
- Recycling process expertise
- Waste incinerators

Hazardous Waste and Brownfield Remediation

In 2011 the Czech Republic had a cumulative 1.5 million tons of hazardous waste to manage. Addressing this challenge will drive demand for modern treatment, containment, and storage technologies.^{cxxxiii} Since the majority of the country's 26 hazardous waste landfills are both industry-specific and industry-owned, opportunities in this area must be forged through relationships with the waste-generating industry at hand.

One of the Czech Republic's most formidable environmental challenges is dealing with the legacy toxic wastes and brown fields that remain from the communist era. Between 1991 and 2008, the Czech Republic had addressed only 25 percent of the waste it pledged to remove. The government must meet an EU mandate to remediate all legacy waste sites by 2015, but limited progress has been seen to date. To get a sense of the size of the potential remediation market, the government previously issued a US\$ 575 million tender to address legacy brownfield sites and wastes.

The bid was subsequently canceled owing to technical issues with implementing such a large tender. However, with EU fines looming, pressure to meet the

2015 deadlines may open up immediate and vast opportunities for U.S. remediation and hazardous waste service providers. Similarly, the government is also mandated to remediate closed coal mining facilities which will provide additional opportunity to U.S. remediation firms.^{cxxxiv}

Key Technologies in Demand:

- Waste handling equipment
- Waste treatment technologies
- Brownfield site remediation design and equipment
- Soil contamination testing and monitoring equipment

ETWG AGENCY INITIATIVES AND PROGRAMS

U.S. Environmental Solutions Toolkit

The Toolkit compiles EPA's environmental regulations, related underlying research, and a list of U.S. companies that provide technologies necessary to implement similar environmental regulatory actions abroad. The Toolkit is used by EPA officials and environmental consultants as a reference tool within bilateral activities that focus on addressing environmental concerns.

Power-Gen International Buyers Program

Power-Gen, one of the leading U.S. power generation equipment and services trade shows, has partnered

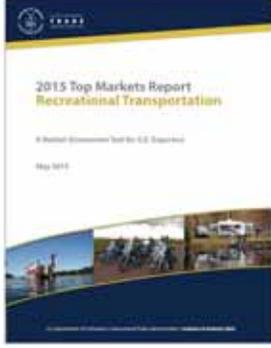
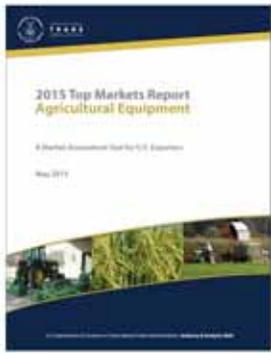
with the Department of Commerce's International Buyer Program to encourage foreign participation in the show. This platform is leveraged to discuss policies and exchange technical information regarding power plant emissions control with Czech participants and to foster business relationships between Czech end-users and U.S. emissions control providers.

WasteExpo International Buyers Program

WasteExpo, one of the leading U.S. waste management trade shows, has partnered with the Department of Commerce's International Buyers Program to encourage foreign participation in the show. This platform was leveraged to exchange relevant technical information with Czech participants and to introduce Czech buyers to U.S. waste management technology providers.

Water Environment Federation Technical Exhibition and Conference (WEFTEC) International Buyers Program

The Department of Commerce, through its International Buyers Program, leads a delegation of Czech officials and business representatives to WEFTEC to explore relevant U.S. technologies and work with U.S. exporters on approaches to water resource management.



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