

**Best Export Markets
For
U.S. Environmental Technologies, 2009**

Best Export Markets for U.S Environmental Technologies consolidates and updates previous Best Market Research Reports on Pollution Control Equipment and Water Resources Equipment. This updated report was compiled by Stephanie Alvarenga, under the supervision of Maurice Kogon, Director of the El Camino College Center for International Trade Development (CITD) in Hawthorne, California. The report is based largely on 2009 Country Commercial Guides (CCGs) prepared by United States Commercial Service (USCS) posts abroad. All CCGs include a standard chapter “Leading Sectors for U.S. Exports.” This report drew from those CCGs which specifically recommended Pollution Control or Water Resources Equipment as a best prospect for U.S. exports.

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Bulgaria	Greece	Mexico	Singapore
Chile	Hong Kong	Morocco	Slovenia
China	Hungary	Netherlands	Sweden
Colombia	India	Peru	Taiwan
Egypt	Indonesia	Portugal	Turkey
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I. Export Market Brief

A. Water Filtering or Purifying Machinery & Apparatus (HS 842121)

This Market Brief provides an overview of the world market for Water Filtering or Purifying Machinery & Apparatus (HS 842121), based on the latest trade statistics and market research.

Export growth: U.S. exports of products in the HS 842121 category rose from \$787.3 million in 2006 to \$957.4 billion in 2009, an increase of 21.6 % over the four-year period.

Leading Export Markets: Canada is by far the leading market for U.S. exports of products in the HS 842121 category (\$153.3 million in 2009), or 16% of total. Other top markets all valued above \$30 million were: Mexico (8.5%), China (6.7%), Japan (5.4%), Korea (5.1%), and Netherlands (3.5%). Other significant markets (above \$20 million) were United Arab Emirates (2.7%), Singapore (2.6%), Australia (2.5%), United Kingdom (2.5%), Taiwan (2.4%), Saudi Arabia (2.3%) and Iraq (2.2%).

Fastest Growing Export Markets: The leading markets with both high and sustained growth rates for U.S. exports of products in the HS 842121 category over the latest four years (2006-09 and continuing in 2008-09) were: Canada, Mexico, and Iraq. Other sustained growth markets in the top 30 over the 2006-2009 period were Malaysia, Peru, Egypt, Kuwait, and Qatar.

Leading Importing Countries: The top foreign importers of products in the HS 842121 category in 2008 (all above \$190 million) were Russian Federation (\$282.3 million, or 6.8% of total), China (5.9%), Canada (5.4%), France (5.2%), and Germany (4.8%). Other significant importers (all above \$130 million) were United Kingdom (4.2%), Mexico (3.7%), Australia (3.4%), and Italy (3.3%).

World Market Size & U.S. Share: Total world exports of products in the HS 842121 category by all countries reached \$5.32 billion in 2008. The U.S. had a 19.4% share of the total world market in 2008. Other world suppliers with significant market shares were Germany (18.1%), Italy (8%), Canada (6.3%), and France (5.7%).

Best Market Prospects: The markets listed below appear to be particularly promising for U.S. exports of Water Filtering or Purifying Machinery & Apparatus products in the HS 842121 category over the next two years; based on recommendations of U.S. commercial specialists in these countries:

Brazil	Finland	Malaysia	Saudi Arabia
Bulgaria	Greece	Mexico	Singapore
Chile	Hong Kong	Morocco	Slovenia
China	Hungary	Netherlands	Sweden
Colombia	India	Peru	Taiwan
Egypt	Indonesia	Portugal	Turkey

I. Export Market Brief

B. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

This Market Brief provides an overview of the world market for Filtering or Purifying Machinery & Apparatus for Gases (HS 842139), based on the latest trade statistics and market research.

Export growth: U.S. exports of products in the HS 842139 category rose from \$1.29 billion in 2006 to \$1.36 billion in 2009, an increase of 5.6 % over the four-year period.

Leading Export Markets: Canada is by far the leading market for U.S. exports of products in the HS 842139 category (\$468.7 million in 2009), or 34.4% of total. Other top markets (all valued above \$40 million) were: Mexico (11.2%), China (6.1%), Saudi Arabia (3.9%), and Japan (3.4%). Other significant markets (above \$20 million) were Brazil (2.8%), Germany (2.6%), Malaysia (2%), Singapore (1.9%), Thailand (1.8%), Korea (1.7%), and Belgium (1.5%).

Fastest Growing Export Markets: The leading markets with both high and sustained growth rates for U.S. exports of products in the HS 842139 category over the latest four years (2006-09 and continuing in 2008-09) were: Saudi Arabia, Brazil, Malaysia, and Singapore. Other significant sustained growth markets in the top 30 over the 2006-2009 period were Australia, Peru, United Kingdom, Nigeria, Chile, France, Indonesia, Spain, and Bangladesh.

Leading Importing Countries: The top foreign importers of products in the HS 842139 category in 2008 (all above \$500 million) were Germany (\$1.69 billion, or 13.4% of total), Canada (7%), China (5.7%), United Kingdom (4.9%), Mexico (4.8%) and France (4.2%). Other significant importers (all above \$300 million) were Belgium (3%), Italy (2.9%), Czech Republic (2.9%), Japan (2.7%), Poland (2.5%) and Turkey (2.4%).

World Market Size & U.S. Share: Total world exports of products in the HS 842139 category by all countries reached \$14.02 billion in 2008. The U.S. had a 12.6% share of the total world market in 2008, topped by South Africa (21%), and Germany (16.9%). Other world suppliers with significant market shares were Mexico (7.7%), United Kingdom (5.1%), and Italy (4.5%).

Best Market Prospects: The markets listed below appear to be particularly promising for U.S. exports of Environmental Technologies over the next two years; based on recommendations of U.S. commercial specialists in these countries.

Brazil	Finland	Malaysia	Saudi Arabia
Bulgaria	Greece	Mexico	Singapore
Chile	Hong Kong	Morocco	Slovenia
China	Hungary	Netherlands	Sweden
Colombia	India	Peru	Taiwan
Egypt	Indonesia	Portugal	Turkey

II. Market Potential Indicators

U.S. Environmental Technologies

A. Top 30 U.S. Export Markets, 2006-2009, by Country. These tables show the leading and fastest growing markets for two categories of Environmental Technologies. Source: U.S. Census Bureau.

1. Water Filtering or Purifying Machinery & Apparatus (HS 842121)
2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

B. Top 30 World Importers, 2008, by Country. These tables show the leading and fastest growing world importers for two categories of Environmental Technologies. Source: United Nations COMTRADE.

1. Water Filtering or Purifying Machinery & Apparatus (HS 842121)
2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

C. Top 30 World Exporters & U.S. Market Share, 2008, by Country. These tables show the U.S. and competitor-country shares of total world exports for two categories of Environmental Technologies. Source: United Nations COMTRADE.

1. Water Filtering or Purifying Machinery & Apparatus (HS 842121)
2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

D. Market Sizes & U.S. Share, 2004-2006, by Country. This table shows each “best prospect” country’s total market, total imports, and imports from the U.S. for Environmental Technologies, and the U.S. market share. Source: U.S. Commercial Staff in each country.

II. Market Potential Indicators
A. Top 30 U.S. Export Markets, 2006-09
1. Water Filtering or Purifying Machinery & Apparatus (HS-842121)

Country	2006	2007	2008	2009	% Change	% Change	% Share
	<i>In 1,000 Dollars</i>				2006-09	2008-09	2009
Canada	123,516	180,775	149,406	153,314	24.1%	2.6%	16.01%
Mexico	48,993	60,545	72,687	81,451	66.3%	12.1%	8.51%
China	46,511	67,823	68,688	64,536	38.8%	-6.0%	6.74%
Japan	61,557	59,418	65,376	51,818	-15.8%	-20.7%	5.41%
Korea	49,663	36,051	44,235	49,074	-1.2%	10.9%	5.13%
Netherlands	26,403	30,256	40,094	32,989	24.9%	-17.7%	3.45%
UAE	11,720	24,860	31,648	25,380	116.6%	-19.8%	2.65%
Singapore	30,221	17,863	25,154	24,701	-18.3%	-1.8%	2.58%
Australia	22,419	38,781	32,713	24,341	8.6%	-25.6%	2.54%
United Kingdom	23,991	28,963	29,683	23,960	-0.1%	-19.3%	2.50%
Taiwan	22,403	30,011	32,574	23,174	3.4%	-28.9%	2.42%
Saudi Arabia	15,571	16,462	39,601	22,220	42.7%	-43.9%	2.32%
Iraq	1,978	608	1,395	20,785	950.8%	1390.0%	2.17%
Malaysia	10,412	16,912	16,115	19,028	82.8%	18.1%	1.99%
Belgium	18,686	22,183	23,668	17,926	-4.1%	-24.3%	1.87%
Germany	7,800	11,681	17,036	16,880	116.4%	-0.9%	1.76%
Brazil	8,451	6,803	17,301	16,662	97.2%	-3.7%	1.74%
France	34,589	32,330	24,235	15,569	-55.0%	-35.8%	1.63%
Peru	1,824	4,314	3,074	14,206	678.8%	362.1%	1.48%
India	11,957	20,118	20,292	12,486	4.4%	-38.5%	1.30%
Thailand	13,054	15,511	26,121	12,439	-4.7%	-52.4%	1.30%
Italy	13,008	16,687	13,960	12,156	-6.5%	-12.9%	1.27%
Spain	9,656	16,328	15,214	11,800	22.2%	-22.4%	1.23%
Egypt	11,136	11,099	7,179	11,642	4.5%	62.2%	1.22%
Kuwait	2,795	4,568	2,725	9,645	245.1%	253.9%	1.01%
Israel	7,177	11,232	10,064	9,550	33.1%	-5.1%	1.00%
Hong Kong	12,453	12,973	10,934	8,465	-32.0%	-22.6%	0.88%
Venezuela	8,824	4,821	8,049	8,255	-6.4%	2.6%	0.86%
Chile	7,556	12,144	9,048	8,034	6.3%	-11.2%	0.84%
Qatar	1,821	3,669	3,355	7,256	298.5%	116.3%	0.76%
Subtotal :	666,143	815,789	861,624	809,743	21.6%	-6.0%	84.58%
All Other:	121,151	145,324	170,116	147,622	21.8%	-13.2%	15.42%
Total	787,294	961,113	1,031,740	957,366	21.6%	-7.2%	100.00%

Source: U.S. Census Bureau

II. Market Potential Indicators
A. Top 30 US Export Markets, 2006-09
2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

Country	2006	2007	2008	2009	% Change 2006-09	% Change 2008-09	% Share 2009
	<i>In 1,000 Dollars</i>						
Canada	550,144	625,356	693,247	468,699	-14.8%	-32.4%	34.40%
Mexico	128,472	163,179	258,429	152,514	18.7%	-41.0%	11.19%
China	61,225	73,892	88,267	82,919	35.4%	-6.1%	6.09%
Saudi Arabia	7,854	8,998	9,589	53,567	582.0%	458.6%	3.93%
Japan	108,931	167,299	91,844	46,173	-57.6%	-49.7%	3.39%
Brazil	20,220	21,852	33,988	38,344	89.6%	12.8%	2.81%
Germany	43,323	56,171	72,159	35,305	-18.5%	-51.1%	2.59%
Malaysia	8,020	9,713	9,186	27,699	245.4%	201.5%	2.03%
Singapore	20,037	24,668	23,045	26,083	30.2%	13.2%	1.91%
Thailand	20,126	25,884	32,676	24,072	19.6%	-26.3%	1.77%
Korea	32,156	36,780	35,940	23,341	-27.4%	-35.1%	1.71%
Belgium	8,587	11,525	21,089	20,827	142.5%	-1.2%	1.53%
Australia	11,970	14,512	16,601	18,484	54.4%	11.3%	1.36%
Netherlands	24,335	20,079	23,473	17,883	-26.5%	-23.8%	1.31%
Peru	4,141	3,389	7,247	17,299	317.7%	138.7%	1.27%
Taiwan	28,346	26,598	30,209	17,108	-39.6%	-43.4%	1.26%
United Kingdom	19,055	26,860	28,819	15,011	-21.2%	-47.9%	1.10%
Egypt	4,458	2,933	7,662	12,744	185.9%	66.3%	0.94%
Nigeria	833	3,570	4,457	12,537	1405.0%	181.3%	0.92%
Venezuela	14,148	9,150	11,769	12,074	-14.7%	2.6%	0.89%
Chile	5,413	7,636	11,566	11,799	118.0%	2.0%	0.87%
Russia	5,955	7,834	17,476	11,776	97.7%	-32.6%	0.86%
France	8,229	13,318	9,610	11,295	37.3%	17.5%	0.83%
India	9,488	19,658	15,395	10,844	14.3%	-29.6%	0.80%
Indonesia	2,259	6,785	8,561	10,619	370.1%	24.0%	0.78%
Hong Kong	15,146	11,311	11,675	10,027	-33.8%	-14.1%	0.74%
Qatar	1,381	91,880	19,370	9,926	618.8%	-48.8%	0.73%
Spain	9,438	8,369	9,682	9,891	4.8%	2.2%	0.73%
UAE	8,769	6,989	10,218	9,513	8.5%	-6.9%	0.70%
Bangladesh	3,022	50	179	9,325	208.6%	5109.5%	0.68%
Subtotal :	1,185,484	1,506,236	1,613,428	1,227,698	3.6%	-23.9%	90.11%
All Other:	104,513	131,390	159,473	134,703	28.9%	-15.5%	9.89%
Total	1,289,998	1,637,626	1,772,901	1,362,401	5.6%	-23.2%	100.00%

Source: U.S. Census Bureau

II. Market Potential Indicators

B: Top 30 World Importers, 2008, by Country

1. Water Filtering or Purifying Machinery & Apparatus (HS-842121)

Importing Countries	Trade Value	% Share 2008
USA	\$646,445,742	15.6%
Russian Federation	\$282,303,296	6.8%
China	\$244,405,222	5.9%
Canada	\$222,834,221	5.4%
France	\$215,163,445	5.2%
Germany	\$198,351,000	4.8%
United Kingdom	\$172,581,237	4.2%
Mexico	\$153,016,330	3.7%
Australia	\$140,081,479	3.4%
Italy	\$137,589,341	3.3%
United Arab Emirates	\$108,516,567	2.6%
Japan	\$107,858,691	2.6%
Belgium	\$95,711,074	2.3%
Singapore	\$75,534,657	1.8%
Romania	\$69,700,816	1.7%
Poland	\$68,782,872	1.7%
Israel	\$68,519,000	1.7%
Switzerland	\$67,760,889	1.6%
Netherlands	\$62,550,986	1.5%
Austria	\$53,611,659	1.3%
Turkey	\$51,033,444	1.2%
Thailand	\$48,590,435	1.2%
Egypt	\$44,856,565	1.1%
Norway	\$42,058,800	1.0%
Pakistan	\$41,617,575	1.0%
China, Hong Kong SAR	\$37,155,174	0.9%
Portugal	\$37,148,452	0.9%
Sweden	\$35,177,196	0.8%
Brazil	\$34,850,388	0.8%
Denmark	\$33,187,105	0.8%
Subtotal	\$3,596,993,658	86.8%
All Other	\$545,083,490	13.2%
Total	\$4,142,077,148	100.0%

Source: United Nations COMTRADE

II. Market Potential Indicators

B: Top 30 World Importers, 2008, by Country

2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

Importing Country	Trade Value	% Share 2008
USA	\$2,582,140,953	20.5%
Germany	\$1,689,731,000	13.4%
Canada	\$877,705,137	7.0%
China	\$720,273,479	5.7%
United Kingdom	\$621,378,337	4.9%
Mexico	\$603,261,973	4.8%
France	\$525,694,116	4.2%
Belgium	\$378,895,654	3.0%
Italy	\$363,989,206	2.9%
Czech Rep.	\$363,130,207	2.9%
Japan	\$343,599,655	2.7%
Poland	\$310,171,598	2.5%
Turkey	\$301,306,569	2.4%
Netherlands	\$252,834,118	2.0%
Russia Federation	\$245,146,777	1.9%
Sweden	\$194,566,070	1.5%
Austria	\$189,782,419	1.5%
Thailand	\$170,554,470	1.4%
Slovakia	\$168,077,096	1.3%
Portugal	\$152,689,569	1.2%
Switzerland	\$149,077,584	1.2%
Australia	\$139,395,541	1.1%
Brazil	\$138,413,553	1.1%
Hungary	\$114,252,000	0.9%
South Africa	\$87,158,424	0.7%
Argentina	\$86,978,277	0.7%
Romania	\$76,816,032	0.6%
Singapore	\$62,558,769	0.5%
Finland	\$57,191,554	0.5%
Denmark	\$55,133,930	0.4%
Subtotal	\$12,021,904,067	95.3%
All Other	\$597,507,980	4.7%
Total	\$12,619,412,047	100.0%

Source: United Nations COMTRADE

II. Market Potential Indicators

C. Top 30 World Exporters, 2008, by Country

1. Water Filtering or Purifying Machinery & Apparatus (HS-842121)

Exporting Country	Trade Value	% Share 2008
USA	\$1,031,740,039	19.4%
Germany	\$964,392,000	18.1%
Italy	\$424,796,543	8.0%
Canada	\$337,307,881	6.3%
France	\$305,080,591	5.7%
Netherlands	\$263,829,758	5.0%
China	\$251,329,157	4.7%
United Kingdom	\$218,010,056	4.1%
Japan	\$148,909,232	2.8%
Belgium	\$128,240,250	2.4%
Sweden	\$118,504,025	2.2%
Denmark	\$110,071,930	2.1%
Mexico	\$95,852,914	1.8%
Singapore	\$91,423,275	1.7%
Israel	\$90,706,000	1.7%
Switzerland	\$83,096,694	1.6%
Austria	\$81,519,202	1.5%
Czech Rep.	\$65,438,405	1.2%
Poland	\$50,618,063	1.0%
South Africa	\$50,396,425	0.9%
Australia	\$49,806,597	0.9%
Turkey	\$37,449,987	0.7%
Finland	\$34,257,202	0.6%
United Arab Emirates	\$32,605,436	0.6%
Russian Federation	\$30,224,635	0.6%
China, Hong Kong SAR	\$27,203,556	0.5%
Latvia	\$22,320,776	0.4%
Lithuania	\$20,443,622	0.4%
Brazil	\$18,513,306	0.3%
Ireland	\$17,849,743	0.3%
Subtotal	\$5,201,937,300	97.8%
All Other	\$118,129,072	2.2%
Total	\$5,320,066,372	100.0%

Source: United Nations COMTRADE

II. Market Potential Indicators

C: Top 30 World Exporters, 2008, by Country

2. Gas Filtering or Purifying Machinery & Apparatus (HS 842139)

Exporting Country	Trade Value	% Share 2008
South Africa	\$2,967,915,008	21.0%
Germany	\$2,390,029,000	16.9%
USA	\$1,772,900,803	12.6%
Mexico	\$1,089,865,982	7.7%
United Kingdom	\$718,634,062	5.1%
Italy	\$631,551,501	4.5%
China	\$550,493,290	3.9%
Japan	\$515,866,769	3.7%
Canada	\$509,012,274	3.6%
Belgium	\$400,092,068	2.8%
France	\$387,220,963	2.7%
Austria	\$288,663,444	2.0%
Netherlands	\$217,659,550	1.5%
Czech Rep.	\$197,044,141	1.4%
Norway	\$196,794,963	1.4%
Poland	\$159,650,598	1.1%
Thailand	\$140,542,396	1.0%
Denmark	\$132,695,547	0.9%
Sweden	\$127,799,790	0.9%
Portugal	\$111,113,631	0.8%
Finland	\$77,439,455	0.5%
Hungary	\$70,183,000	0.5%
Switzerland	\$69,341,727	0.5%
Singapore	\$66,091,839	0.5%
Turkey	\$49,292,440	0.3%
Brazil	\$48,396,155	0.3%
China, Hong Kong SAR	\$40,136,874	0.3%
Slovakia	\$37,304,122	0.3%
Slovenia	\$28,477,647	0.2%
Russian Federation	\$27,265,087	0.2%
Subtotal	\$14,019,474,126	99.3%
All Other	\$97,885,000	0.7%
Total	\$14,117,359,126	100.0%

Source: United Nations COMTRADE

II. Market Potential Indicators

D: Market Sizes & U.S. Share, 2006-2008, by Country

The Table below provides comparative data on total market, import market, and import from the U.S. for 19 countries considered “best prospects” for U.S. exports of environmental technology. The countries are listed in alphabetic order, not in rank order. The data are based on local sources and reflect best estimates of USCS commercial officers in each country. Statistical accuracy and comparability to other sources (e.g., “USDOC Bureau of Census”) are affected by a number of factors, including lack of published figures in certain markets, variances in data collection techniques, sources of data, and industry definitions.

Environmental Technologies (Values in \$ Millions)

Country	Total Market			Total Imports			Imports from US			% U.S. Share
	2006	2008	% Change	2006	2008	% Change	2006	2008	% Change	2008
Chile*	296	457	54%	45	460	922%	18	110	511%	24%
Columbia	150	290	93%	154	300	95%	87.7	160	82%	53%
Egypt*	2125	2570	21%	1922	2324	21%	768.3	929.65	21%	40%
Finland	4,370	4,835	11%	3456	3580	4%	191	132	-31%	4%
Greece*	890	1106	24%	640	840	31%	80	120	50%	14%
Hong Kong	170	200	18%	550	600	9%	170	190	12%	32%
India**	4300	4645	8%	1720	1807	5%	568	630	11%	35%
Indonesia*	180	220	22%	210	250	19%	30	40	33%	16%
Malaysia	737	803	9%	806	867	8%	133	145	9%	17%
Mexico	5880.5	6366.8	8%	4631	4945.9	7%	3412.2	3601.9	6%	73%
Peru	168	274	63%	172.2	284.2	65%	60.9	96.8	59%	34%
Saudi Arabia	540	595	10%	320	353	10%	80	88	10%	25%
Singapore*	4798	4193	-13%	8440	7786	-8%	2349	1833	-22%	24%
Sweden	13143	15197	16%	2790	3460	24%	202	235	16%	7%
Taiwan	405	505	25%	357	448	25%	92	79	-14%	18%

*2007-2009

**2006-2007

Source: U.S. Commercial Staff in Each Country

III. Best-Prospect Market Assessments

Following are overviews of “best” markets for U.S. Environmental Technologies, based on observations of U.S. Commercial Service (USCS) posts in each country. The countries appear in alphabetical order. For more detailed market research on Environmental Technologies in these and other specific markets, see relevant Market Research Reports listed in Chapter VI. For general commercial and economic information on individual countries, see the relevant Country Commercial Guides (CCGs).

BRAZIL

Overview

Environmental experts estimate that Brazil’s environmental technologies market (including equipment, engineering/consulting services and instrumentation associated with pollution control and cleanup projects) is valued at roughly \$4.9 billion, of which \$2.3 billion is related to the water and wastewater sub-sector (water and sewage); \$2.5 billion in solid waste management ; and \$400 million in air pollution control.

Water and Waste Water

Recent events had a positive impact in the sanitation sector and increased investments in the business. Law 11455 of January 2007 established the regulations, defined the national policy for the sector, enabled states and municipalities to make their sanitation plans, to create consortiums and establish private-public partnerships. A Federal Government social program, known as the *Economic Acceleration Program (PAC)*, attracted \$18.4 billion to the sanitation sector from 2007 to 2010, using funds from the federal government, state, municipal and private investors. The PAC’s investment priorities are as follows: Integrated sanitation services in slums (\$1.84 billion), Water, Sewage, Waste disposal and rainwater management in mid and large cities (\$1.84 billion), Water, Sewage, Waste disposal and rainwater management in cities of up to 50,000 inhabitants (\$1.84 billion); Loans to States, Municipalities and water and wastewater utilities (\$5.5 billion); and Loans to private service providers and market operations (\$3.7 billion).

Air Pollution Control

The need to comply with the existing legislation on pollution emissions, the reutilization of raw materials and adoption of environmentally friendly policies, determine investments in air pollution control equipment and services. Industry experts estimate that this market is to increase by about 20% per year. In addition to the industrial market, the increased number of CDM projects in sanitary landfills in Brazil, is also creating a demand for gas emission monitoring technologies.

Solid Waste

Although urban cleaning and public waste management services are under the responsibility of municipalities, some major private sector companies participate through contracts or long-term concessions. In addition, there are several Brazilian manufacturers of solid waste treatment equipment. There are also a number of companies, several of them international firms, in the business of hazardous waste treatment. All of these companies visit solid waste expositions in the United States. Figures from the Brazilian Association of Urban Cleaning and Hazardous Waste Collection and Treatment Companies (ABRELPE), indicate that the sector generates annual revenues of \$2.17 billion, has a fleet of 9,600 compactor trucks, and invests \$300 million in compactor trucks/year. Investments in sanitary and hazardous waste landfills are expanding

significantly, as 90% of Brazil's 5,562 municipalities lack sanitary landfills for waste disposal. Although smaller than the public sector, the private sector is an important market for pollution control technologies. Some of the driving forces affecting this market are stricter environmental legislation, pressure from communities and clients, the introduction of environmental management practices by a growing number of industries and increased number of industries with ISO 14001 certificates. The ISO 14001 certificate requires continuing improvement in production processes and adoption of pollution prevention measures. Industries in Brazil demand technologies for water reuse, solid waste treatment, recycling, CDM for greenhouse gases, etc.

Opportunities

U.S. companies generally export products such as soil/water contamination treatment equipment and services; healthcare waste treatment technologies; laboratory instruments; odor control products, recycling technologies, etc.

Resources

- US Commercial Service Industry Specialist Teresa Wagner at: Teresa.Wagner@mail.doc.gov

BULGARIA

Overview

Bulgaria's accession to the EU requires a large-scale environmental remediation and implementation of new environmental standards. Bulgaria will have to invest more than EUR11.6 billion by 2013 in order to meet EU environmental requirements, some of the funding coming from EU funds for environmental infrastructure projects. Bulgaria will need to import almost all of the technology for these requirements, and U.S. companies that possess world-class technology, equipment, services and systems at competitive prices will be best poised to benefit from these opportunities.

Water and wastewater: Most industries in Bulgaria need to construct or upgrade their wastewater treatment facilities in the next 3-4 years in order to meet the new EU requirement. Urban wastewater treatment plants are planned for 430 cities and towns with populations over 2,000 until 2015.

Solid waste: Currently, Bulgaria utilizes landfills for the disposal for municipal waste. The EU requires Bulgaria to decrease the number of landfills. There is a critical need to find more environmentally friendly ways to handle hazardous, solid, and industrial waste, such as waste-to-energy, recycling, and waste minimization.

Air: The air-pollution control sector will provide opportunities for construction of air-pollution control installations at large industrial facilities.

Resources

- Ministry of Regional Development and Public Works www.mrrb.government.bg
- Ministry of Environment and Water www.moew.government.bg
- Stanislava Dimitrova, Commercial Specialist, U.S. Commercial Service, Sofia, Bulgaria
Tel: 359-2-939-5740; Email: Stanislava.Dimitrova@mail.doc.gov; www.buyusa.gov/bulgaria

CHILE

Overview

During the past 15 years, Chile has worked very hard to identify the many environmental problems in the country. It has conducted studies and implemented monitoring systems in order to dictate regulations and standards and define strategies for prevention, decontamination and clean production. Today, Chile has a leading role in the region, due to its environmental laws and a stable economy. Many Latin American countries follow the model that Chile is using or has already tested. As a result, Chile has become a platform country for the transfer of environmental technology and expertise to other Latin American countries.

In the water/sanitary sector, regulations in place are key to generating a larger demand for pollution control equipment, specifically in water and wastewater treatment equipment and technologies, waste management and engineering, and consulting services. By 2010, Chile expects to reach 100% coverage in terms of potable water, sanitation, sewage, and 98% of water treated. However, the area where Chile has made extraordinary progress is in waste management. Since 2005, Chile has put in place a Management Policy for Solid Waste. During recent years, Chile has approved several norms in this area, including a Regulation for Hazardous Waste. Currently, almost 60 % of total residential waste is disposed in landfills that have sanitary and environmental certification. Recycling of domestic solid waste has become a growing business. As of 2004, about 9% of solid waste from Santiago was recycled annually. The 2010 goal is 20%.

In wastewater treatment plants, an investment of more than \$2 billion dollars is estimated between 2006 and 2016. Many projects have been completed and others are already underway. Local sources estimate that imported equipment accounts for approximately 25-30% of the total cost of new water treatment plants. The Santiago Metropolitan Region generates approximately seven million tons of waste per year, 50% of which is domestic waste. Nearly 60% of domestic waste is disposed of in landfills with environmental and sanitary guarantees. By law, each municipality is responsible for the cleanliness and maintenance of its community. The municipalities are also in charge of calling for bids on solid waste projects.

Best Products/Services

Water and Waste Water Treatment:

- Project design and construction of water treatment plants
- Preventive maintenance techniques in water treatment plants, such as vibration, laser alignment, oil dialysis and others
- Models for the study of hydrodynamic behavior within certain processes
- Biological biosolid evaporation processes and the latest generation biosolid evaporation systems
- Recollection, transport, and building of landfills, especially outside of Santiago
- Solid and hazardous waste management and disposal
- Plastic/rubber liners for disposal sites;
- Hazardous/hermetic storage containers and drums
- Recollection and disposal of construction and mining waste
- Container compressor systems or other financially viable systems
- Safe waste-handling implements
- Autoclave machines, vapor sterilization and related services
- Consulting and engineering services

Resources

- National Environmental Commission: www.conama.cl
- Association of Environmental Companies and Professionals: www.aepa.cl
- Environmental Commission of the Manufacturers Association: www.sofofa.cl
- Institute of Public Health: www.ispch.cl
- Superintendence of Sanitary Services: www.siss.cl
- Asociación Chilena de Municipalidades: www.munitel.cl

CHINA

Overview

China not only has enormous needs for cleaner energy, air and water, but is also able to afford the massive investment and imports to meet the need. In 2007, China overtook the U.S. as the world's biggest carbon dioxide (CO₂) emitter. The World Bank estimates the total cost of air and water pollution in China at roughly \$50.2 billion, or about 2.7% of GDP. Acid rain costs an estimated \$4.2 billion in crop damage and \$138.7 million in material damage annually. About 54% of surface water resources in China have been deemed unsafe for human consumption. With its still growing economy and large dollar surpluses, China is one of the very few countries able and willing to spend heavily on sustainable energy and pollution control.

"China's ... fast economic growth [projected at 6.5% in 2009] has already made important contribution to the world economy, and it will continue playing that vital role in world's economic recovery....The economic stimulus plan that China unveiled last November [2008] calls for 2008-2010 investment equal to 13% of its GDP, undeniably a huge contribution to the world growth." China's central bank reported that foreign exchange reserves, already the world's largest, rose 16% since April 2008 to reach \$1.9537 trillion in March 2009.

The Chinese Government has set ambitious state investment targets for renewable energy and environmental cleanup. In November 2008, the Government unveiled a \$585 billion Economic Stimulus Plan, with \$105 billion alone slated for rural area water safety projects, urban wastewater treatment, key water body pollution control and ecological environment protection. Chinese projects already underway or planned offer huge new opportunities for California's green technologies.

China's acute environmental problems stem from a deteriorating natural resource base, dense population, heavy reliance on coal, outmoded technology, under-priced water and energy, and breakneck industrial growth. In response to this situation, the government has unleashed a burst of environmental legislation, shut down thousands of small, dirty factories, and decreed by 2010 the country will reduce its total pollution discharge by 10% from the 2005 level and reduce energy consumption by 20% per GDP unit. Government projections for 2010 and 2020 indicate that the green technology market will increase to \$186 billion in 2010 and to \$555 billion in 2020.

Air pollution. As of early 2008, 39.5% of Chinese cities do not meet the national standard II of air quality; 28% of cities are below the national particulate matters standard; 20.9% of cities are below the national SO₂ standard; and 281 of 500 cities monitored suffered from acid rain, accounting for 56.2% of the total. Responding to this serious situation, the government required that by 2010, desulfurization devices should be installed on coal-fired boilers at power plants where medium or high sulfur coal is used. All newly built, expanded or renovated coal-fired power plants must include installation of desulfurization equipment. The market value of the desulfurization industry will reach an estimated \$725 million if only 5% of all the large-sized

coal-fired power plants install desulfurization equipment. As the government comes to realize the imperative of De-NO_x of Power Plants Flue Gas, U.S. De-NO_x technology and equipment providers will find great market potential in China in the next 5-10 years. Experts predict the market will be booming in late “11th-five year plan (2006-2010)” and entire “12th-five year plan (2011-2015),” as regulations and laws are established gradually and systematically. Experts predict the market will be booming in late “11th-five year plan (2006-2010)” and entire “12th-five year plan (2011-2015),” as regulations and laws are established gradually and systematically.

Water pollution. China faces severe water pollution and water scarcity problems. China generated 55.6 billion tons of wastewater in 2007, including 31 billion tons of municipal wastewater and 24.6 billion tons of industrial wastewater. By 2010, total wastewater will reach 64 billion tons, due to rapid urbanization and industrialization. One third of China’s rivers, lakes, and coastal areas are severely contaminated from municipal, industrial and agricultural discharges. Over 17,000 counties and towns have no wastewater treatment plants, and nearly 300 million people are currently drinking contaminated water. In 2006, 420 out of 669 cities suffered from water scarcity. The current wastewater treatment infrastructure is inadequate, and rural area wastewater treatment is virtually non-existent. In the 11th Five-Year Plan, two major targets set by the central government are constructing a water-saving society and treating water pollution. It aims to provide safe drinking water to 100 million residents, and treat 70% of sewage. In order to meet the goals, 1,000 new WWTPs (representing investment of \$4.4 billion will be constructed, raising total daily treatment capacity to 10,000 tons.

Solid waste. The Chinese solid waste treatment market holds tremendous opportunities for U.S. equipment and service providers. Despite China’s position as the world largest municipal solid waste (MSW) generator, China’s solid waste treatment rate remains very low. Among the 661 cities throughout the country, 334 cities do not have any MSW treatment facilities. To tackle this problem, the Chinese government unveiled aggressive plans to improve the solid waste treatment rate. According to the plans, from 2006-2010, China will invest \$14.9 billion in building fixed asset MSW treatment facilities, and will seek to raise non-harmful treatment rate of MSW to no lower than 60% by 2010. On the industrial waste side, China will maintain the policy of “reducing and recycling.” As for hazardous waste treatment, the country is allocating \$1.99 billion to build 31 hazardous waste treatment centers, 300 centralized disposal facilities for medical waste and 31 warehouses for radioactive waste in the next three years. Therefore, good potential market opportunities exist for American suppliers.

Best Prospects/Services

- Biological de-nitrification and phosphorus removal technologies, sludge treatment
- Membrane separation and manufacturing technologies and equipment,
- Manufacturing technology of anaerobic biological reactor,
- High concentration organic wastewater treatment technology and equipment,
- Series-standard water and wastewater treatment equipment family with high efficiency,
- Water saving technologies and equipment,
- Water treatment agents,
- Water and wastewater treatment facility operation and management service,
- Natural water body rehabilitation technology, and
- Sea water desalinization
- Remote Network Monitoring System and Alarming System for Water Network
- Video Monitoring System
- Information Network System and Database Management System
- CODCR Online Automatic Monitoring Instrument

- TOC Water Quality Analyzer
- UV Absorption Automatic Online Monitoring Instrument
- pH Water Quality Automatic Online Analyzer
- Ammonia & Nitrogen Water Quality Automatic Analyzer
- Total Phosphorus Water Quality Automatic Analyzer
- Ultrasound Open-Channel Meter
- Electro-Magnetic Flow Meter
- Water Automatic Sample Collector
- Data Collecting and Transfer Equipment
- Thermometers
- Flow Meter

Resources

Ministry of Environmental Protection <http://www.sepa.gov.cn/>
 China Association of Environmental Protection Industry <http://www.cepi.com.cn/>
 China Environmental Daily <http://www.cenews.com.cn>
 China National Environmental Monitoring Center <http://www.cnemc.cn/>
 Beijing Environmental Monitoring Center <http://www.bjepb.gov.cn/bjhb/tabid/189/Default.aspx>
 Tianjin Environmental Monitoring Center <http://www.tjemc.org.cn/lxwm/lxwm.asp>
 Shanghai Environmental Monitoring Center <http://www.semcc.com.cn>
 Guangdong Environmental Monitoring Center <http://gdemc.gov.cn/>
 Guangzhou Environmental Monitoring Center <http://www.gemc.gov.cn/>
 Ministry of Water Resources <http://www.mwr.gov.cn/>
 Ministry of Housing and Urban Construction www.cin.gov.cn
 China Urban Water Supply Association www.waternet.net.cn

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COLOMBIA

Pollution Control Equipment

The country's estimated coverage of potable water infrastructure reached 97.4% of the urban population providing 90.2% of the population with access to sewer system. In the country's rural areas the situation is different. Aqueduct service coverage reaches 66%, and sewer system access reaches only 57.9% of the inhabitants.

Colombia's Water Regulatory Agency (CRA) estimates that nearly 45% of the treated water (by the country's 1,800 water utilities) goes unaccounted for. Water is available, produced, but not paid for by the users, or is lost because of inadequate piping systems. This system creates a large problem for utilities and users and negatively affects potential future investments. Government sources estimate that the country needs to make environmental investments in the range of \$3.3-\$3.4 billion per year to maintain an adequate level of protection against all sources of pollution.

The Ministry of Environment, Housing, and Territorial Development (MMA) assumes that close to 80% of Colombia's municipal entities dispose of untreated wastewater into rivers or lakes. Colombia is a regional leader in the development and implementation of a wastewater pollution

“tax” (tasa retributiva). However, only a few environmental agencies have established regional funds to finance wastewater treatment facilities. Cities such as Bogotá and Medellín own wastewater treatment plants, and other cities such as Cartagena are developing an underwater outfall system with World Bank funding or are developing plans for other treatment systems. Nevertheless, funding remains a central concern. Medellín is developing plans for a new wastewater treatment plant that could cost approximately \$300 million.

Given the large negative health impacts for the country’s inhabitants that are estimated to reach up to 3.7% of the country’s gross domestic product, the government has enacted stricter regulations setting limits for air pollution emission levels for mobile and fixed emission sources. However, much remains to be done in terms of improved environmental regulations, policy, environmental regulations enforcement, and capacity building for the different environmental agencies. Key focus areas include integrated water resource management and air monitoring systems, wastewater treatment and sewerage systems, underground water supply, and toxic and hazardous wastes collection and disposal.

A major obstacle to this sector’s growth is the current fiscal deficit that affects the availability of resources from the government budget and insufficient investments from private entities. Most public sector funds are expected to come from transfers from the electric power sector, and the collection of royalties, taxes, and other contributions from so-called “green markets”. New financing arrangements to stimulate private sector investment in this sector include new credit and tax incentives, such as sales and income tax exemptions for the use of environmentally sound technologies, new economic instruments and pollution charges, carbon dioxide sequestration options, and other stock market alternatives.

Under the US - CTPA, 79% of U.S. environmental goods and equipment would receive duty-free treatment immediately. The remaining equipment tariffs will be eliminated in a period of between five to 11 years. In addition, Colombia will eliminate its prohibition on the importation of remanufactured environmental goods and equipment upon entry into force of the Agreement. Additionally, the US -CTPA would eliminate tariffs on most remanufactured construction equipment immediately and will phase out tariffs on a small number of remanufactured goods over ten years.

Best Products/Services

- Water and wastewater treatment plants
- Water pollution monitoring and control equipment
- Pumps, valves
- Solid waste hauling and disposal equipment
- Air pollution monitoring and control equipment
- Environmental services (consulting)
- The operation and management of municipal services such as providing potable water and collection and hauling and disposal of solid waste

Opportunities

CRA is developing new regulatory methodologies to incorporate the cost of “unaccounted for” water, and the cost of sewage collection into end-user fees to allow for the financing of large infrastructure projects needed throughout the country. In addition, the MMA is working on the incorporation of pollution charges to fund the cost of wastewater treatment plants. There are several projects with partial multi-lateral banks funding, including the Bello wastewater treatment plant (\$336 million), in Medellín that could be completed by 2010. Regulations regarding air

pollution and solid and hazardous wastes are being developed at a time when public financing is almost non-existent, and enforcement has traditionally been lacking. These conditions are expected to change if the proposed US - CTPA is ratified by the U.S. Congress and implemented. Industry sources believe that the agreement would encourage the government and private sectors to improve environmental compliance with the country's regulations, which could result in increase investment in pollution prevention and control equipment. These changes will be necessary in order to comply with the agreement's environmental provisions.

Resources

- CS Bogotá Commercial Specialist Julio Carbo (Julio.carbo@mail.doc.gov)
- Ministry of Environment, Housing, and Territorial Development: www.minambiente.gov.co
- Invest in Colombia Corporation (*Coinvertir*): www.coinvertir.org
- Colombian Hydrology, Meteorology and Environmental Research Institute: www.ideam.gov.co
- Colombian Government: www.gobiernoenlinea.gov.co
- Water and Basic Sanitation Regulatory Commission (CRA): www.cra.gov.co

EGYPT

Overview

The Egyptian government's plan to cover Upper Egypt and rural areas with new sewage system networks, and portable water stations will be limited due insufficient funds. However, Egypt is an active beneficiary of World Bank financing for major projects in the environment sector. This provides an added advantage for U.S. companies offering advanced technologies to increase their market share beyond the current estimated value of 40%.

Best Products/Services

- Solid Waste Management Equipment and Operation
- Incinerators
- Industrial Filters
- Landfills
- Equipment for Recycling Plants
- Kits for Converting Motor Vehicles to Use Natural Gas
- Filters to Reduce Particle Emissions from Cement Factory Smokestacks
- Equipment and Filters to Reduce the Pollution Coming from Power Plants
- Sanitary Wastewater Projects
- Composting Programs
- Water and Sludge Treatment Projects, Filters and Services

Opportunities

There are opportunities for U.S. firms in recycling and waste management. The GOE is also seeking clean methods to recycle agriculture waste to reduce the air pollution caused by Egyptian farmers who burn the waste.

Resources

Contact the Commercial Specialist in charge of the Environmental Sector Rania Mekhail, Email: Rania.Mekhail@mail.doc.gov

FINLAND

Overview

The market for environmental technology is estimated to be over \$4 billion in 2008, including professional services. The market growth is likely to slow down mostly due to the economic downturn having a heavy impact on the metals and the pulp and paper industry, the two major investors in environmental technology. The primary technology investments for these industries have been air pollution and water protection technologies.

The environmental sector in Finland has evolved into a dynamic area where production of new technologies is gaining international prominence. Both individuals and leaders of industry have become highly conscious of the high standards of environmental protection and preservation. In Finland, the necessity for utilizing the best available technology is included in the Water Act, Air Pollution Control Act, Waste Act and Sea Protection Act. In addition, the producer responsibility principle in waste management has increased reuse and recycling, offering new business opportunities.

Demand for air pollution control equipment continues to be strong in Finland due to increasing environmental concerns in the surrounding countries (i.e. in Russia the Kola Peninsula, St. Petersburg and the Baltic States). Given the U.S. reputation for providing high quality air pollution control equipment, these products have good potential in Finland.

The key competitive factors in selling environmental technology in Finland are quality and level of technology, with price as a secondary factor. Using a distributor / importer is highly recommended, as they have direct distribution channels to the end users, strong relations with various industry representatives, and direct access to the municipalities. There are over 2,000 environmental technology companies in Finland operating in different segments of the market. About 20% of the companies have operations abroad. The majority of the companies are small-to-medium size companies, but there are a few big global players as well.

The government-funded technology centers -- Tekes -- (Technology Development Center) and VTT (Technical Research Center of Finland) -- support and enhance R&D in environmental technologies. As a result of a national environmental business development program in 2007, Cleantech Finland concept was launched with an objective to make Finland the leading country in the environmental business, thus creating a market with increased local competition.

Best Products/Services

- Air and water pollution: Monitoring, measuring and sampling instruments for detection of air and water pollution.
- Sulfur dioxide emissions removal: All types of advanced air cleaning technologies that are used in the pulp and paper, chemical, and heavy metal industry, as well as in municipal energy and power plants. Given the high level of demand, competition within this market sector is strong.
- Nitrogen oxide emissions: The demand for nitrogen oxide emission removal equipment is growing, which includes catalytic converters and low nitrogen oxide combustion technology for burners and boilers.
- Small particles and dust reduction equipment: Products such as dynamic and electrostatic precipitators; fabric filters; centrifugal fans and blowers.
- Waste management: Equipment to improve waste management processes, in particular closed systems for lumber companies and for the prevention of phosphorous discharges.

- Municipal waste recycling and recovery: New technical advances for the entire recycling logistics chain, including sensors, separators, monitoring, optic handling device for metal recycling, crushers, and bio waste separation equipment.

Resources

- <http://www.environment.fi>
- <http://ted.europa.eu/>
- mia.maki@mail.doc.gov (local contact)
- Tekes, the National Technology Agency is the main public financing and expert organization for research and technological development in Finland. Tekes finances industrial R&D projects as well as projects in research institutes. Tekes especially promotes innovative, risk-intensive projects. <http://www.tekes.fi>
- VTT, Technical Research Center of Finland is the biggest contract research organization in Northern Europe. VTT provides high-end technology solutions and innovation services and offers opportunities through its international scientific and technology network. VTT operates as a research and development partner in several fields of technology, the environment included. <http://www.vtt.fi>

GREECE

Overview

The environment is one of most important issues of this decade in Greece. The Greek market for environmental equipment and services is expected to far outstrip local capacity in the future. Although, according to European Union (E.U.) statistics, Greece has one of the poorest records on tackling environmental problems in the E.U., the Greek Government's efforts to improve environmental quality are impressive.

According to the Greek Ministry of Environment, the Greek environmental market is estimated at approximately \$2.2 billion, 1.5% of GDP. Investments in environmental infrastructure through E.U. and national programs have been the centerpieces of environmental progress in Greece. These investments have been used for the construction of numerous wastewater and solid waste treatment facilities, as well as the building of new recycling plants, composting facilities and treatment plants for industrial and hazardous waste materials.

The implementation of E.U. environmental legislation in national laws has also created the appropriate institutional basis for successfully facing Greece's environmental protection challenges. In early January 2007, the Minister of Environment announced that the Ministry's investment plan for the upgrading, modernization and protection of environmental projects, such as waste management, recycling, water treatment, purification systems, and desalination, for the period 2007 – 2013 is \$6.3 billion, and will be implemented through the operational program "Environment and Sustainable Development."

Greece, following E.U. directives and tendencies, is committed to introducing the necessary legislative framework for promoting the use of "clean" or "green" technologies that are friendlier to the environment. Renewable Energy Sources will play a major role in the continuously alternating geopolitical map of energy. The White Paper COM (97) 599/26 -11-97 sets the Communal strategy for Renewable Energy Sources. The E.U. promotes the balanced use of all fuels in order to reduce harmful emissions, mainly GHG gases and CO₂, while maintaining sustainable development.

In an effort for Greece to catch up with its commitments under the Kyoto Protocol, the Minister of Environment recently signed a decision approving Greece's National Allocation Plan for Emission Trading in 2008-2012. The minister said that this will bring about a 16.6% reduction in greenhouse gas emissions for 152 industrial enterprises. The industrial complexes included in the emissions trading plan include 33 power plants, 24 other furnace-type installations, four refineries, a smelting plant, five iron and steel plants, eight cement plants, 18 lime production plants, one glass factory, 44 ceramics factories and 14 paper factories.

The total CO₂ emission rights for the period 2008-2012 have been set to 345 million tons of carbon dioxide, all of which are allocated free of charge. About 4.8% of the total emission rights allocated, amounting to 16 million tons of carbon dioxide, have been set aside for new plants during 2008-2012. As these efforts continue, the Greek market for environmental equipment and services will have excellent growth potential over the next several years.

Municipalities or other government entities control over 98% of Greek waste collection, waste and water management, recycling and treatment facilities. Consequently, providing environmental engineering services in the Greek market means contracting with Greek government authorities at various levels. In order to do so successfully, foreign firms usually align themselves with Greek engineering companies in partnerships and consortia. These partnerships make U.S. business interests eligible for E.U. funding.

U.S. engineering and consulting firms that specialize in environmental projects enjoy a very good reputation for superior project planning and delivery. An unofficial estimate of the U.S. share of this market is around 10%, not including equipment supplied by European subsidiaries of U.S. firms. European companies - mainly British, German and French - dominate around 65% of the import market. They are favored because of the proximity and knowledge of the Greek market versus U.S. companies that may find it expensive and time consuming to enter this new market. Despite the strong competition from European companies, U.S. share may increase over the next few years, as many decision-makers in search of environmental solutions visit the U.S. and various sites in Europe where U.S. companies operate landfills and recycling sites utilizing modern technology.

Best Products/Services

The areas that hold the greatest potential for U.S. firms to export technology and equipment, and to serve as consultants in the Greek environmental market are:

- Innovative technologies for the development and operation of waste management and recycling facilities
- Innovative technologies for treatment and disposal of hazardous and medical waste
- New technologies to create valuable end-products from any form of waste
- Biomass facilities
- Composting equipment
- Water and waste water treatment technologies, aeration and purification systems
- Air and sea pollution products
- Clean coal Plants
- “Green building” materials
- Emission monitoring equipment
- Emission reduction technologies
- Photovoltaic plants

- Technologies that convert energy from olive waste (Greece is one of the major olive producers in the world)
- Consulting and engineering services for the development and operation of waste, recycling and water management

Opportunities

As Greece is trying to catch up with its commitments under the Kyoto Protocol and implement E.U. environmental legislation in national laws, numerous opportunities are becoming available for U.S. suppliers of innovative environmental technologies, and U.S. engineering and consulting firms specializing in the development of waste, recycling and water treatment facilities. U.S. equipment, products, know-how and services are known for their outstanding quality and enjoy an excellent reputation.

Resources

<http://www.minenv.gr>

<http://www.viron-sustain.gr>

HONG KONG

Overview

Hong Kong has been allocating significant resources toward tackling air pollution, water pollution and solid waste treatment problems.

Waste Management; Owing to the imminent need to extend the life of existing landfills and construct a new Integrated Waste Management Facility (IWMF), solid waste management solutions and technologies will absorb most of the Hong Kong Government's (HKG) investment in the environment in the next few years. Two possible sites for the IWMF have been identified, pending feasibility review. The core technology of the IWMF will be waste-to-energy incineration (the first phase calls for a capacity of approximately 3,000 tons per day), supplemented by sorting and recycling technologies. In addition to the IWMF, the HKG will develop an organic waste treatment facility at another location.

Among the HKG's waste management initiatives is the establishment of EcoPark, a facility dedicated to value-added waste recycling. Phase I of the EcoPark has already come on line and Phase II will further create a demand for high-end recycling processes and technologies for handling batteries, tires, electronic goods, plastics and wood. Phase II is scheduled for completion in late 2009.

Wastewater Management. The majority of Hong Kong's wastewater undergoes primary treatment through the Harbor Area Treatment Scheme (HATS). Stage 1 of HATS was completed in December 2001. Stage 2A of HATS requires the provision of additional disinfection, the construction of sewage tunnels and expansion of existing chemical treatment capacity whereas Stage 2B requires the installation of biological treatment facilities. Detailed planning is underway with the aim of completing Stage 2A in 2014. The timing of Stage 2B, to be undertaken in 2010-11, will depend upon a review of water quality trends, population increases and sewage flow build up.

Air Pollution. Hong Kong's air pollution problem is a regional one. The HKG has agreed with the authorities in mainland China's Guangdong Province to cut emissions of major air pollutants, i.e., sulfur dioxide, nitrogen oxides respirable suspended particulates, and volatile organic

compounds (VOC), to meet stringent caps by 2010. Power generation is the primary source of local emissions of these pollutants. The HKG signed the Scheme of Control Agreements with the two Hong Kong power companies, Hong Kong Electric and China Light and Power, on January 7, 2008, which stipulated that the permitted rate of return of the power companies would be linked to their emissions performance. Both power companies have started their own overall retrofit program, and the project will be completed in phases between 2009 and 2011.

The recent decision by China Light and Power to cancel construction of an LNG terminal near Hong Kong Island has greatly complicated the utility's plans to meet the new emissions standards after 2010, as conversion from coal-fired to natural gas-fired power generation was a key component of their compliance strategy.

In neighboring Macau, the local government expanded its waste incineration facility, tightened emission standards, built a hazardous waste treatment plant, set up waste classification and recycling stations, and expanded its wastewater treatment plant in 2005-2006. The Macau Government invested a total of \$132 million and \$158 million in 2005 and 2006 respectively in "planning and environment" projects, representing 6.7% and 7.3% of total public administration expenditure respectively. This public investment increased at an average annual growth rate of more than 50% during the period 2004 to 2006.

Macau imports power from the China Southern Power Grid to meet almost 70% of its total power need. Locally, Macau will increasingly rely on natural gas for power generation in response to the public's desire for cleaner air. CEM (the only power generation company in Macau) will gradually replace the existing heavy fuel generation facilities at the Macau Power Station with gas-fired generation units.

Best Products/Services

Air:

- Analytical instruments
- Vehicle emission particulate reduction devices
- Desulphurization/de-nitrification technologies

Water/wastewater:

- Water filtration equipment (such as biological filtration)
- Disinfection technologies (UV, membrane & ozonation)
- Analytical instruments

Solid waste:

- Mechanical-biological treatment (waste sorting & separation)
- Biological treatment (composting)
- Waste-to-energy technologies
- Recycling technologies for handling batteries, tires, electronic goods, plastics and wood

Opportunities

The market for industrial pollution prevention equipment also has been growing. The vast majority of Hong Kong's manufacturers (estimated total of 80,000 industrial establishments) have shifted production to southern China especially the Pearl River Delta. Traditionally, these manufacturers purchase equipment from Hong Kong suppliers. Recently, the authorities in southern China have been encouraging these manufacturing facilities to recycle as much as 75%

of water consumption and to invest in green production processes, creating a rise in the demand for water reuse and recycling, as well as energy efficient and clean production technologies. Partnering with Hong Kong-based firms has been a successful model for selling to Mainland factories, many of which are Hong Kong-owned. Recent attention to air pollution, combined with plans to develop regional emissions trading in China and Hong Kong, improve prospects for air pollution and emissions reduction technologies.

Resources

- Environmental Contractors Management Association www.ecma.org.hk
- Green Council www.greencouncil.org
- Hong Kong Environmental Industry Association www.hkenvia.org
- Hong Kong Waste Management Association www.hongkongwma.org.hk
- Ms. Olevia Yim, Sr. Commercial Specialist Email: olevia.yim@mail.doc.gov
Tel: (852) 2521-1467; Fax: (852) 2845-9800

HUNGARY

Overview

Hungary has tightened environmental performance standards due to European Union accession requirements, creating new opportunities for environmental technology and service providers. EU financial support for environmental infrastructure projects will spur growth in this sector in coming years, possibly as much as 15% annually. In 2007, investment in the environmental sector was \$932 million. According to Hungary's Central Statistical Office, wastewater treatment now accounts for 47% of all environmental spending, waste treatment for 12%, air quality about 23%, soil and groundwater quality 8%, protection of landscape and nature for 6%, and noise pollution 1%. The environmental sector has about 2,000 firms, mostly SMEs and micro-sized companies, employing roughly 20,000 people. The Ministry of Environment expects employment to increase to 40,000-50,000 by 2010, although these estimates may be revised downward in the short term to reflect current macroeconomic trends and realities.

U.S. firms are active in the Hungarian pollution control market, primarily in project management and consulting. Stiff competition exists in this sector from Hungarian, as well as German, French, Italian, Japanese and Scandinavian firms.

The EU is set to provide 22.4 billion Euros (\$30.7 billion) to Hungary, from 2007-13, to finance infrastructure upgrades, as part of the New Hungary Development Plan. The NHDP is broken down into 15 Operational Programs approved by the government. Pollution control projects are part of the Environment and Energy Operational Program (\$6.7 billion) and regional programs.

Selling to the public sector requires participation in public bids. The Government Procurement Agreement (GPA) allows U.S.-based firms to bid on certain EU contracts above established thresholds. U.S. firms legally established in a Member State of the EU are accountable as a European company. Those firms may bid on EU public procurement contracts advertised just as any other European firm. However, U.S. companies interested in the Hungarian market should strongly consider partnering with a local firm. The local partner will be able to provide information on local business practices, pertaining rules & regulations, the decision making process and provide technical assistance.

Best Products/Services

- Waste management (prevention, re-use and recycling, and environmentally friendly treatment);
- Wastewater treatment;
- Protection of groundwater (main source of drinking water in Hungary);
- Improvement of drinking water quality (building out water treatment technology, switching to other water bases, switching to other water supply systems).

Resources

- Ministry of Environment and Water: www.kvvm.hu
- Ministry of Environment and Water Development Directorate: www.fi.kvvm.hu
- Central Directorate of Environment and Water: www.ovf.hu
- Association of Environmental Service Providers and Manufacturers: www.kszgysz.hu
- Hungarian Water Utility Association: www.maviz.org
- National Association of Waste Management Companies: <http://hoe.internettudakozo.hu>
- National Development Agency: <http://www.nfu.hu/?lang=en>
- Commercial Specialist – Agnes Pandur: agnes.pandur@mail.doc.gov

INDIA

Overview

It is estimated that 30-40% of India's industrial units produce sizeable quantities of pollutants. There are about 3 million small-scale units in the country and most of these are not using any pollution control equipment. The Government of India has classified 17 industrial sectors as strong pollutants. India is one of the largest and one of the fastest growing producers of greenhouse gases. India's pollution control equipment industry is growing at 10-12% annually, largely because of government initiatives and a proactive judiciary. The biomedical waste management segment has been growing at a rate of 20% per year due to enforcement of the Bio-medical Waste (Management and Handling) Rule of 1998. Some of the advanced equipment required for treatment of biomedical waste must be imported from developed countries, as they are not manufactured domestically, which creates significant opportunities for U.S. providers. We also expect the import from the U.S. would increase due to the weakening of the U.S. Dollar and the general preference to U.S. products and services.

The pollution control equipment industry is unorganized and dominated by small-scale industrial firms lacking the resources to invest in research and development. There are a few Indian engineering companies offering services and equipment as part of turnkey consulting services.

The Ministry of Environment and Forests governs this sub-sector. A third of its annual budget is allocated for pollution abatement. However, the market is not restricted to the government sector. Government initiatives are aimed at taking pollution control beyond end-of-the-pipe issues. The private sector has been investing substantially in environmentally friendly production processes and accounts for nearly 40% of demand in this segment.

Poor enforcement of environmental laws is a key reason for the low market potential compared to developed countries. The market for end-of-the-pipe equipment is price sensitive, so consumers generally favor equipment with low life cycle costs. Imports constitute nearly 40% of the total market share due to two main factors:

- Unlike other sectors, multi-lateral and bi-lateral agreements on ecology and the environment play a major role in this sector. This results in increased demand for imported pollution control equipment, because donor-led investments normally require international quality equipment that is not manufactured in India.
- Multinational corporations with manufacturing facilities in India insist on the replication of technology for pollution control. This almost always requires imports. The United States has traditionally enjoyed a dominant position in the market, with nearly 33% of market share. In some segments such as air pollution control equipment, imports from Industry sources believe that the import market will continue to increase and the domestic market share will decline due to increasing demand for improved and innovative technologies that cannot be met by domestic suppliers.

Resources

- US Commercial Service Industry Specialist Preetha Nair at: Preetha.Nair@mail.doc.gov
- Ministry of Environment and Forest: <http://envfor.nic.in/>
- Ministry of Non-Conventional Energy Sources: <http://www.mnes.nic.in/>
- The Energy & Resources Institute: <http://www.teriin.org/>
- Everything About Water: <http://www.eawater.com/>
- Central Pollution Control Board: <http://www.cpcb.nic.in/>

INDONESIA

Overview

There are two principal markets in Indonesia for environmental technologies, industrial waste treatment and the municipal waste management. Wastes produced from oil refineries, mining sites, and factories are considered industrial waste. Sewers, household garbage, and small commercial are categorized as municipal wastes.

Although Indonesia has fairly rigorous environmental laws, industrial pollution is a major problem because enforcement is absent or lax. As such, pollution control is performed voluntarily. Manufacturers do exercise some control over their emissions. The large multinational corporations operating in Indonesia usually adhere to relatively high environmental standards, and buy substantial amounts of environmental services and products. While local manufacturers are less willing to spend on pollution controls, their spending habits may change with the implementation of ISO 14000. Although the participation of ISO 14000 is voluntary, many export manufacturers will likely to want to upgrade their environmental standards in accordance with ISO 14000, especially if they want to export to Europe.

Although the industrial waste treatment industry is still in its early stages of development, there are indications that the industrial treatment industry will grow rapidly in coming years. One positive sign in recent years is the willingness of large foreign waste management firms to invest heavily in hazardous waste treatment facilities in Indonesia.

Opportunities

On the municipal side, the environmental market includes the construction and management of wastewater treatment, water supply, and solid wastes. In recent years, the Indonesian government is banking on a hands-off approach, assigning the private sector a greater role in building up the country's much needed urban environmental infrastructure. This means American consultant and management firms may not only bid on large environmental infrastructure projects but also

provide the financing and manage revenue collection. The new approach will likely translate into greater profit-making potential.

Resources

- Ministry of Environment Website: <http://www.menlh.go.id>
- Ministry of Public Works Website: <http://www.pu.go.id>

MALAYSIA

Overview

Under the Malaysian Plan from 2006 to 2010, the Malaysian Government placed emphasis on preventive measures to mitigate and minimize pollution and to strike a balance of promoting sustainable natural resources management and development. Solid wastes constitute a growing problem, and the amount generated in Malaysia is increasing faster than it can be disposed of efficiently. The growing population and increasing consumption are generating up to 1kg/capita/day or an equivalent of 30,000 tons of rubbish per day. Modern convenience and a “disposable” lifestyle are aggravating the solid waste situation especially in larger cities. Current solid waste composition is made up of 45% food waste, 24% plastic, 7% paper and 6% iron. Approximately 95-97% of waste collected is taken to landfill for disposals. The remaining waste is sent to small incineration plants, diverted to recyclers/re-processors or is dumped illegally. Upgrading of unsanitary landfills, construction of new sanitary landfills, and transfer stations with integrated material recovery facilities are being carried out in phases with recycling, and handling of specific types of solid waste like plastic, paper etc. as emphasis.

The government aims to have 22% of the waste recycled by 2020. The approval in mid 2008 of the National Strategic Plan for Solid Waste Management will see a more systematic and organized solid waste collection and disposal structure in Malaysia. Solid Waste Management providers have not upgraded their equipment over the past decade, but after the implementation of the Solid Waste and Public Cleansing Management Act 2008, providers will be pressed to improve for better and efficient services. Prior to 2008, waste management was controlled at the municipal level, but after the implementation of the above Act, control will be handed over to the Federal Government.

Best Products/Services

- Technology, equipment and know-how within the area of solid waste management and solid waste disposal equipment
- Automated rubbish sorters or sorting plants and equipments.
- Environmentally friendly waste disposal plants and equipment
- Equipments such as Refuse Collection Vehicles and Equipment similar to RORO trucks

Opportunities

Companies for joint ventures and/or transfer of technology in the fields of strategic environmental planning, waste handling, handling of hazardous substances, recycling, recovery and transformation of “*waste to wealth*” and “*waste to energy*” technology, refuse derived fuel

Resources

- Ministry of Natural Resources and Environment
- The Malaysian Water Association
- Institute for Environment and Development
- Ministry of Energy, Water and Communications

- Waste Management Association of Malaysia
- Commercial Specialist Randall Liew

MEXICO

Overview

During 2009 and 2010, local, state, and federal environmental authorities plan to implement water, wastewater, and solid waste projects that have been postponed during the last two years. Water projects remain a priority within the National Infrastructure Program 2007- 2012. The total market for the environmental sector is estimated to have grown by 1.5% during 2008. Major competitors in this market are French, German, Spanish, Canadian, British, and Japanese companies. The recent 30% peso depreciation relative to the U.S. dollar has rendered U.S. products and services more expensive. However, in the large health-related public works projects, the current exchange rate is not expected to significantly impact competitiveness of U.S.-sourced goods and services.

Best Products/Services

- | | |
|--|--|
| <ul style="list-style-type: none"> • Blowers • Diffusers • Air Filters • Check Valves • Chemical Tanks • Mixers • Control Panels • Flow Switches • Pipe • Brass Fittings • Submersible Pumps • Portable Pumps • Manual Valves • Sewage Valves • Reverse Osmosis Membranes • U.V. and Cartridge Filters | <ul style="list-style-type: none"> • Primary Clarifiers; • Irrigation Equipment • Liners for Landfills; • Solid Waste Containers; • Solid Waste Recycling Equipment; • Dust Collectors; • Hazardous and Toxic Waste Transportation Equipment; • Autoclaves for Medical Waste; • Medical Waste Transportation Equipment; • Bio-remediation Technology; • Environmental Engineering Services; and • Design and Engineering Services. |
|--|--|

Opportunities

The environmental sector will continue to be one of the leading sectors in the Mexican economy during the period 2009-2014. During the summer of 2008, the federal government created the National Infrastructure Fund (FONADIN) that will finance 73 water and wastewater projects. The fund has also designated financing for four solid waste projects in Mexico City and the states of Morelos, Mexico, and Chiapas. Among the projects that were postponed in 2008 but will be announced in 2009 are:

- Mexico City: Closing of landfill and design/construction of a new landfill and recycling facility;
- Mexico City: Construction of methane gas energy plant;
- Mexico City: Construction of three potable water plants; five municipal wastewater treatment plants and two pumping stations;
- State of Jalisco: Construction of a \$487 million aqueduct;
- San Luis Potosi, Construction of \$152 million aqueduct;

- State of Tamaulipas: Construction of a \$473 million aqueduct;
- Puerto Peñasco: Construction of a desalination plant;
- States of Jalisco, Hidalgo, Sonora: Construction of wastewater treatment plants and rehabilitation of over 150 existing municipal waste water treatment plants in various cities of Mexico.

Resources

- Secretariat for the Environment and Natural Resources: <http://www.semarnat.gob.mx/>
- National Water Commission: <http://www.cna.gob.mx>
- National Institute of Ecology: <http://www.ine.gob.mx/>
- Attorney General for Environmental Protection: <http://www.profepa.gob.mx/>
- Mexican Institute for Water Technology: <http://www.imta.gob.mx/>
- National Council of Environmental Executives: <http://www.conieco.org/>
- National Bank for Public Works: <http://www.banobras.gob.mx/>
- National Bank for Imports and Exports: <http://www.bancomext.gob.mx>
- U.S. Commercial Service, Mr. Francisco Ceron E-mail: Francisco.ceron@mail.doc.gov

MORROCO

Wastewater Treatment. Morocco is a semi-arid country with limited water resources. As a developing country with a high birth rate, Morocco faces the issue of increased water residue and the difficulty in finding alternative solutions to protect the environment and to improve quality of life. Since Morocco is losing about 10% of its water table each decade, it is imperative to find alternative methods to purify water and treat wastewater associated with urban and industrial pollution.

Plans for increasing water supply capacity in Morocco to meet higher rural population demand and the dominant agricultural sector offer a growing market to U.S. suppliers of water and wastewater equipment. For the upcoming five-year period, total imports are expected to increase at an average annual rate of 20%. Morocco already imports 90% of its water and wastewater treatment equipment. The remaining 10% consists of pipes and conduits produced locally. Today, Morocco needs state-of-the-art technology adapted to new water purification and wastewater treatment equipment for the current needs of the country.

Best Products/Services

- Seawater Desalination
- Water and wastewater treatment projects,
- Rural Water Distribution Technology and Desalination Projects
- High-pressure Water pumps,
- Monitoring Equipment,
- Demineralization Systems,
- Water Treatment and distribution equipment,
- Chemicals for Water Treatment,
- Remote Control Equipment.

Opportunities

The National Office of Potable Water (ONEP), which produces about 80% of the potable water for the entire country, has identified several aquifers used for drinking water in many regions of Morocco that have been contaminated with high levels of nitrates. ONEP plans to conduct several

feasibility studies to identify the extent of the contamination and select appropriate technologies to treat the groundwater, and also to define the best way to re-use water and to build plants for potable water discharge treatment. In 2007, USTDA approved a \$378,000 grant to ONEP to fund the cost of goods and services required for technical assistance on a proposed Meat Processing Facility Wastewater Treatment System. In 2008, the African Development Bank also granted \$102 million to ONEP to finance more efficient and energy saving potable water distribution, and to increase quality potable water distribution from 1.6 million by 2008 to 2.4 million in 2020, in five cities and more about 300 small towns, and in new three new tourist areas.

Faced with 32% of the rural population underserved, providing safe drinking water to the countryside is a priority for Morocco. As the main supplier of potable water, ONEP plans to spend \$800 million in water distribution improvement. In addition, the Government of Morocco plans to invest \$1.5 billion in water projects to satisfy at least 80% of water needs to the rural population by 2010. The Government is planning to invest \$6.5 billion by 2015 for sewage systems upgrading. Plans are to create autonomous sewage systems in both large and small cities for wastewater treatment and water purification systems.

Resources

- <http://www.onep.org.ma>
- <http://www.adb.org>

Solid Waste Management. Demographic growths, rapid urbanization, and neglect have increased the problems of waste disposal. Management of solid waste presently represents a major environmental issue. In December 2006, the Moroccan Government published the Law 28-00 to address solid waste issues and plans to invest \$4.4 billion (MAD 37 billion) over the next 15 years starting from 2008. The purpose of this law is to ensure that household waste is properly collected using the most appropriate techniques in controlled landfill.

Large Moroccan cities are moving towards delegating the management of solid waste to private firms through international tenders. Cities such as Casablanca, which produces 3,000 tons of solid waste per day, launched international tenders to grant ten- to twenty-five year concessions. The company Ecomed which is the local representation office of the U.S. company Edgeboro-GESI won this tender. The consortium Edgeboro-GESI-Ecomed is also managing the landfill in the city of Fes while the one located in the city of Marrakech has been forwarded to the French company Segedema.

Best Products/Services

- Solid Waste Management Engineering services
- Solid Waste Disposal Power Plants to produce energy from waste materials
- Bio-mass technology recycling

Opportunities

Many other tenders are expected for the years 2009-2010. The largest two projects in the year 2009 are for the city of Safi with a volume of 109, 719 tons of solid waste and in the city of Nador with its neighboring communes with a volume of 100,000 tons of solid waste. In the year 2010, the two main projects are located in the north of the country in the cities of Tangier (248,446 tons) and Tetouan (133,169 tons). Privatization and concessions of landfills are expected to generate a number of opportunities for U.S. firms supplying equipment for waste processing and biogas plants, as well as equipment for disposal and recycling. U.S. equipment and know-how enjoy an excellent reputation in Morocco. U.S. firms are already present in the market for solid waste management.

Resources

Department of Environment: <http://www.minenv.gov.ma> Ministry of Interior – Water and Sewage Department

NETHERLANDS

Overview

The Netherlands is one of the most densely populated countries in the world and also has the highest density of industry, cattle and transport in the European Union. Its economic, industrial and leisure activities are extensive and expanding so, not surprisingly, the quality of its environment is facing serious threats.

The environmental sector consists of suppliers of products and services for environmental management. Suppliers of products (manufacturers and importers) manufacture, supply and/or install equipment and installations designed to prevent or combat pollution. The service providers are engaged in design and engineering activities, project management, policy support, sampling and analysis. There are 1,455 companies operating in the Dutch environmental sector. The majority are SMEs. The sector supplies innovative solutions for the following environmental themes: waste disposal and processing, wastewater treatment, air purification, soil remediation, environmental noise control, environmental management and consultancy. The market is largely a replacement market dominated by orders to replace old machinery and equipment rather than purchase new equipment for the first time.

Current environmental policy objectives include continuing the implementation of strict environmental rules and regulations, focus on soil remediation, reduction of the domestic warming effect and noise control.

A high priority in the Netherlands is reducing air pollution. The National Institute for Public Health and the Environment (RIVM) of the Netherlands estimates that each year 18,000 people die prematurely because of air pollution in the Netherlands. Cutting pollution levels can help and is a European priority. Pollutant emissions have fallen substantially over the past two decades, but are still dangerously high. Current regulations in the Netherlands are insufficient to reach European air quality targets. New measures and a new approach are required.

Water pollution. The Dutch have always been famous for their expertise in water control management. When the levies and dikes gave way in New Orleans a team of engineers was dispatched to assist the U.S. Army Corps of Engineers with repairing and reinforcing the various structures. Since the market in the Netherlands is very sophisticated and highly specialized, opportunities that exist for U.S. companies are mostly in state-of-the-art water treatment equipment and measuring and analysis instruments.

Air Pollution. Air pollution remains a serious problem in the Netherlands. Emission of fine dust, ammonia and nitrogen dioxide in the Netherlands is the highest of Europe. Moreover, much pollution is being blown from neighboring countries (situated between the German Industrial Ruhr area and the bulk of Britain's heavy industries). It is widely expected that European guidelines for 2010 will not be met. In 2009 Europe will decide upon emission ceilings for 2020. Market opportunities exist for equipment for monitoring air quality, air testing instruments, fuel gas desulphurizing and purifying equipment, gas monitors and samplers, particulate emission collectors, and NOX and SO2 analyzers.

Soil Pollution. Soil pollution is a substantial problem in the Netherlands; the Dutch government is investing heavily in new techniques and subsidies. A total of some 1,200 soil remediation projects take place in the Netherlands every year. About 175,000 locations are so polluted they need cleaning.

Best prospects

- Advanced and fast soil decontamination processes, for example washing soil and biological decontamination.
- New chemical processes
- Faster biological cleaning methods
- New ground isolation techniques (to keep soil from polluting ground water) are highly sought after.

Opportunities

The U.S. Mission to the European Union regularly reports major procurement opportunities in the Environmental Technologies sector that are open to U.S. companies: http://www.buyusa.gov/europeanunion/eu_tenders.html

Resources

- Aquaterra – World Forum on Delta and Coastal Development
Web: <http://www.aquaterraforum.com/>
- VLM - Association of Suppliers of Environmental Technology
Sector Manager: Ms. Trudi van Spankeren
E-mail: vlm@fme.nl Web: <http://www.vlm.fme.nl>
- RIVM – National Institute for Public Health and the Environment
E-mail: info@rivm.nl
Web: <http://www.rivm.nl/>
- VROM – Ministry of Housing, Spatial Planning and the Environment Web: <http://www.vrom.nl>
- Netherlands Water Partnership E-mail: info@nwp.nl Web: <http://www.nwp.nl>

PERU

Overview

In May 2008, the Government of Peru created a new Ministry of Environment. The establishment of this new agency is likely to elevate the importance of environmental protection in government policy making and lead to a greater demand for products and services designed to lessen the impact of development and commercial operations on the environment. A key focus of the new ministry is likely to be the contamination of Peruvian rivers and water supplies resulting from mining operations, particularly from informal, unregulated mining activities. The most common soil contaminants in Peru are mining tailings, petroleum-based products and other hazardous chemicals that need to be kept from contaminating drinking water. A number of major municipal water treatment projects are also under development which may afford opportunities for private firms.

The solid waste collection system in Peru is deficient, with the country experiencing serious waste disposal problems due to disorderly, explosive, urban growth of the larger cities. Lima, the capital city of 8 million inhabitants, produces 7,000 tons of solid waste per day, of which almost

one third is dropped into non-regulated dumps. There are less than five operating dumps throughout the country.

Air pollution is a major problem, particularly in Lima. It is primarily generated by very high concentrations of particulate material and auto emissions.

Best Products/Services

- 903289 Other automatic voltage and voltage-current regulators
- 90318080 Other instruments and appliances and machines for measuring or checking instruments, appliances and machines, not specified or included elsewhere in this chapter, profile projects, parts and accessories thereof
- 842121 Filtering or purifying machinery and apparatus for liquids
- 8481803010 Gate type of iron, having a pressure rating of 850 kPa or over
- 8705900000 Other special purpose motor vehicles, other than those principally designed for the transport of persons or goods
- 841360 Other rotary Positive Displacement Pumps, Nesoi
- 84813090 Other check (non-return) valves
- 8481100090 Other pressure reducing valves
- 84211900 Other centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus, for liquids or gases; parts thereof
- 847410 Sorting, screening, separating or washing machines

Equipment in high demand includes soil and water remediation and monitoring equipment, filters for the industrial sector, garbage trucks, recyclers, water and sewerage monitoring devices and systems, water filters, and wastewater treatment solutions.

Opportunities

According to Government projects, the investment plan for water resources, water treatment and wastewater treatment projects through 2015 could total \$2.7 billion. Some of the ongoing projects handled by Sedapal, the water and sewage agency, include: The Huascacocha water transfer project between the Departments of Junin and Pasco, consisting of a dam of 12 meters in height and 500 meters length; 36.2 Km of conducting channels; and a tunnel of 3 meters. This project was awarded to OAS (Brazil) and is a \$76.9 million BOT concession.

The Huachipa potable water treatment plant awarded to Camargo Correa (Brazil)/OTV France, includes a water inlet of 10 m³/s; the first stage of a water treatment plant of 5 m³/s; 26 Km of pipes; 2 tunnels of 5 km each, and 5 reservoirs. This \$248 million project will benefit 2.4 million residents in Lima and the neighboring district of Callao.

Other projects include the concession of La Chira and Taboada wastewater treatment plants (both BOT) of \$342 million and \$154.7 million respectively. A planned desalinization plant in southern Lima is projected to cost \$285.6 million, comprising the design and construction of a 1 m³/s plant to supply water in the districts located south of Lima.

Resources

- Lima Water and Sewage Company: <http://www.sedapal.gob.pe>
- Ministry of the Environment: <http://www.minam.gob.pe>
- Ministry of Energy and Mines: <http://www.minem.gob.pe>
- Ministry of Housing, Construction, and Sanitation: <http://www.vivienda.gob.pe>
- Sanitation Services Regulatory agency: <http://www.sunass.gob.pe>

PORTUGAL

Overview

Environmental management and pollution control is an increasingly important and prominent sector nowadays, particularly in light of global attention to issues of resource sustainability and protection. Over the years, Portugal has made progress with respect to a number of international environmental issues. Although Portugal still lags in terms of tackling some environmental problems in the EU, the Portuguese Government continues to improve and highlight the importance of progress to promote a cleaner and sustainable environment in Portugal. The Portuguese demand for innovative environmental equipment and services is expected to continue to be high during the next three to five years.

The consolidated environmental protection expenditure (EPE) of the Portuguese Government in 2007 was around \$1.32 billion, a growth of 7% compared with previous year. The sales volume for producers of environmental goods and services reached \$5.79 billion in 2007, of which 19% was under “Collection, Purification and Distribution of Water”, 14% under “Collection and Treatment of Other Waste” and 11% under “Recycling of Metal Waste and Scrap.”

Source: INE It is also important to note that 38% of total sales volume resulted from activity in a wide range of non-environmental sectors, mainly “production and distribution of electricity” and “architectural and engineering activities and related technical consultancy.”

“Service Provider“ was the main type of activity carried out by environmental goods and services companies, representing 77% of total turnover from the environmental goods and services sector.

Best Products/Services

- Recycling technologies
- Filtering and purifying machinery
- Technologies for treatment and disposal of hazardous waste
- Composting equipment
- Heavy metal collecting equipment
- Sensors and analyzers
- Water treatment technologies
- Waste water treatment aeration and purification systems
- Air and sea pollution products
- New technologies to create valuable end-products from any form of waste
- Consulting and engineering services for the development and operation of waste management and recycling facilities.

Opportunities

Investments in environmental infrastructure through EU and national programs have been the centerpieces of environmental progress in Portugal. These investments have been used for the construction and upgrade of numerous wastewater and solid waste treatment facilities as well as the building of new recycling plants, composting facilities and treatment plants for industrial and hazardous waste materials.

The transposition of EU environmental legislation into national law has also created the appropriate institutional basis for successfully addressing environmental protection challenges.

In 2007, the Portuguese Government approved the following programs:

- PERSU II - Plano Estratégico para os Resíduos Sólidos Urbanos (National Strategic Plan for Urban Solid Waste) 2007/2016 - with an investment of \$2.74 billion focusing in areas such as valorization of organic waste and improvement of the selective collection systems.
- PEAASAR II - Plano Estratégico de Abastecimento de Água e Saneamento de Águas Residuais (National Strategic Plan for Water Supply and Wastewater Systems) 2007/2013 – with an investment of \$5.48 billion used for project development, infrastructure, setup and equipment supply and construction supervision and management of related projects.
- ENEAPAI - Estratégia para Efluentes Agro-Pecuários e Agro-Industriais (Strategy for Agro-Industrial and Pig Farming Effluents) 2007/2013 – with an investment of \$794 million.

Other programs are currently being developed and are expected to be approved soon, such as:

- Estratégia Nacional de Resíduos Industriais (National Strategy for Industrial Waste)
- Plano Estratégico de Resíduos Hospitalares (Strategic Plan for Hospital Waste)
- Plano Nacional de Resíduos (National Plan for Waste)
- Estratégia Nacional de Prevenção de Resíduos Sólidos Urbanos (National Strategy to Avoid Urban Solid Waste)

As these efforts continue, the Portuguese market for environmental equipment, technology and services will have strong growth potential over the next several years. In order to take advantage of existing and future business opportunities and successfully enter or expand into the Portuguese market, foreign firms usually align themselves with Portuguese companies in joint ventures, consortiums and cooperation agreements. These types of collaboration make U.S. business interests eligible for EU funding.

Resources

- Pedro Ferreira – Commercial Specialist http://www.buyusa.gov/portugal/en/our_team.html
- Instituto Nacional de Estatística <http://www.ine.pt>
- Instituto Regulador de Água e Resíduos

SAUDI ARABIA

Pollution Control Equipment. The environmental industry in Saudi Arabia has recently become an emerging and growing area of business opportunities. The Saudi Government's aim is to preserve the environment and clean up the country after decades of abuse caused by public and corporate neglect and ignorance. As a result, pressure has been building on all concerned parties to comply with stringent new regulations. In addition, in recent years the Saudi Government has reinforced its environmental efforts by participating in international conferences and signing international agreements to promote a cleaner environment.

Major sources of air pollution in Saudi Arabia are power, desalination, cement, and industrial plants that account for much of the sulfur dioxide and nitrogen oxide emissions from fixed sources. The Government has ordered all major industrial projects to conform to international air standards in order to limit emissions, but there has been little in the way of monitoring and enforcement. Although there are several Government agencies involved in environmental protection, the level of compliance with environmental regulations remains low due to a lack of technically qualified personnel, laboratory facilities and equipment to monitor pollution, and enforcement mechanisms.

Best Products/Services

- Environmental engineering and sciences especially for pollution, remediation, groundwater, and air quality
- Recycling systems and equipment Wastewater treatment systems especially for water re-use
- Sewage systems
- Solid waste management and systems
- Equipment and treatment systems for marine pollution
- Air pollution control equipment, and monitoring devices.

Opportunities

The Kingdom's current infrastructure and 5-year public sector building plan is valued at over \$53 billion. Six mega cities are under construction, and hundreds of thousands of housing units are to be constructed. All projects and inhabitants will produce waste requiring the latest in recycling and waste management. This multi-billion dollar sector continues to be under-developed and holds substantial business opportunities for U.S. suppliers.

Saudi Arabia generates more than 50,000 tons of healthcare waste per year. The Kingdom has more than 1,850 health centers now, with 80 hospitals under construction, and new projects including over 250 primary care centers and 8 new hospitals. Each requires the most advanced medical waste disposal methods.

The Presidency of Meteorology and Environment (PME), the governmental environmental regulating agency, – plans to out-source most of its tasks to the private sector. Many studies and procurements are under way to improve the environmental monitoring, enforcement, and understanding. Saudi Aramco, the Royal Commission for Jubail and Yanbu, and Saudi Basic Industries Corp. (SABIC) all have major environmental initiatives ongoing.

Resources

- Ministry of Water & Electricity (MOWE) www.mowe.gov.sa
- The Presidency of Meteorology and Environment (PME) www.pme.gov.sa
- Royal Commission for Jubail & Yanbu www.rcjy.gov.sa
- Saudi Basic Industrial Corp. (SABIC) www.sabic.com
- Saudi Aramco www.saudiaramco.com

Water Resources Equipment. Saudi Arabia lies in an arid area of the world with severe climate conditions, and an absence of permanent natural surface water resources such as rivers and lakes. In addition, Saudi Arabia's high population growth, rapid urbanization, industrialization and agricultural development make water one of the most precious resources in the Kingdom. In order to meet expected demand growth for water, the Kingdom will have to invest \$4.5 billion a year in infrastructure development over the next 20 years.

Saudi Arabia has established 30 desalination plants on the Red Sea and Arabian Gulf coasts at a total cost of \$18 billion. The country is rapidly depleting its 2.2 billion cubic meters of proven groundwater. 23% of water comes from aquifers, 70% from desalination and 7% from wastewater reclamation. 80% of water has been used in questionable agriculture projects, such as the world's most heavily subsidized wheat production. 30% of household water comes from desalinating. Saudi Arabia is the biggest user of desalinated water in the world (36% of world's total), and demand is growing by at least 3.4% year. While the cost of desalination is falling, it still costs \$1.33 to process, deliver and remove the waste from one cubic meter of such water, while a Saudi consumer pays only 4 cents. The Ministry of Water and Electricity (MOWE) announces study

after study to rationalize water tariffs and privatize the state owned Saline Water Conversation Corporation (SWCC).

With its budget surplus, the Saudi Government is working on a number of large projects, primarily in the water and sewage system, in an attempt to meet the needs posed by population growth and industrial growth. Major infrastructure projects include the construction of a 20 new water distribution network, 20 new the desalination plants, the refurbishment of the Jeddah desalination Plant-5, the expansion of Asir II desalination plant, Yanbu/Medina III desalination plants, and the expansion of wastewater treatment plants in Jeddah, Riyadh, and Dammam. In 2003, the Saudi Government brought the Kingdom's water and power sectors under a single authority, the Ministry of Water and Electricity (MOWE). The governing body sets forth general policies and strategies that aim to expand and improve Saudi Arabia's basic utilities. More specifically, the Ministry has issued guidelines for the operation of Saudi Arabia's Independent Water and Power Projects (IWPPs).

Further, MOWE has established a regulatory authority to help implement its policies, as well as corporations to develop new power and water projects. Also in 2001, the Royal Commission for Jubail and Yanbu founded the Power & Water Utility Company for Jubail and Yanbu known as (Marafiq). This company is responsible for planning and developing power and water utilities in Jubail and Yanbu industrial cities.

Another major development took place in May 2003 with the establishment of a new company, Water & Electricity Company (WEC), between the Saline Water Conversion Corp. (SWCC) and Saudi Electricity Co. (SEC) to carry out the independent Water and Power Project (IWPP) in partnership with the developer. There are three IWPP projects under bidding: at Shuqaiq (Phase 2), Ras Al-Zour, and Jubail (Phase 3). The three projects will have desalination water capacity of 1870 million cubic meters of desalinated water per day.

In 2006, the new National Water Company (NWC) was founded. It will facilitate privatization process and oversee the regional operations under PPP contracts. In the long term, NWC will oversee most water and wastewater operations in the Kingdom. The National Water Company will include regional business units and a core to manage and provide strategic guidance.

Saline Water Conversion Corporation (SWCC). Established in 1965, the Saline Water Conversion Corporation (SWCC) is the entity responsible for operating the country's 30 desalination plants and providing fresh water for the entire country. It is also the country's second largest supplier of power with 12 plants generating 3,426 MW. In 2007, the SWCC spent \$1.04 billion (SR3.9 billion) to develop its activities, a 24% increase from 2006. In recent years, the SWCC has embarked upon a privatization plan, which established the National Water Company (NWC).

The state-owned desalination plant operator will be a holding company with separate production and transmission subsidiaries. As of November 2008, the SWCC had completed five of seven stages that will result in the company's privatization. The SWCC is currently awaiting approval of the final two stages by the Supreme Economic Council. Based on the IWPP model, the private sector will be able to participate and contracts may begin in August 2009. With the privatization of the SWCC and the creation of the National Water Company, the water sector is expected to be under full private control by the end of the decade.

Independent Water Projects (IPPs). Private sector investment is emerging as a key component in the upgrading and expansion of Saudi Arabia's water infrastructure. The IPP concept is also

gaining ground among Saudi Arabia's leading organizations, including the Ministry of Commerce & Industry, Ministry of Water & Electricity, PCA, and Saudi Aramco, which are contracting local and international private companies to build desalination plants for their mega projects.

Saudi Aramco IWP. In June 2003, a consortium, led by the U.S. company Aquatech and including the local Rabigh Desalination Co., was awarded a \$20 million contract to build a desalination plant for Saudi Aramco's Rabigh refinery complex. The project, which stipulates a 20-year water conversion agreement, is expected to come on stream by 2006. In August 2005, a consortium led by Marubeni and Itochu, and including the local ACWA Power Projects, was awarded a \$1.1 billion contract to build a co-generation and desalination plant for the Rabigh integrated petrochemical and refining complex jointly owned by Saudi Aramco and Sumitomo Chemical. An engineering, procurement, and construction (EPC) contract for the cogeneration and desalination plant was also awarded to Mitsubishi Heavy Industries Ltd. on a turn-key basis. The project, which stipulates a 25-year water and energy conversion agreement, is expected to come on stream by 2008.

Water & Electricity Company (WEC). In October 2005, the Shuaiba IWPP was awarded to a Saudi Malaysian consortium: The \$2.4 billion project involves a 20-year power and water purchase agreement to produce 900 MW of electricity and 880 cubic meters of desalinated water per day. The Shuaiba IWPP is expected to come on stream by the third quarter of 2006.

Power & Water Utility Co. for Jubail & Yanbu "MARAFIQ". On January 1, 2003, the Power and Water Utility Company for Jubail and Yanbu (MARAFIQ) was established to undertake the operation, management, expansion and construction of seawater cooling systems, water desalination plants, sanitary and industrial wastewater systems and electric power systems, thus providing essential utility services to industrial, commercial and residential customers in the industrial cities of Jubail and Yanbu. In December 2006, Marafiq Jubail was awarded to French-Belgian Utility consortium: The \$3.3 billion project involves a 20-year power and water purchase agreement to produce 2,800 MW, and 800,000 cubic meters of desalinated water per day. The project would be to start production in the second half of 2009.

Best Products/Services

The Saline Water Conversion Corp. (SWCC) continues to study the introduction of 20 new saline water conversion projects to be implemented in the near future to meet the demand increase for drinking and civil used water. The 20 new projects will include constructing new plants and expanding existing ones. SWAC would like to see more American companies involved in those projects due to their high tech and good reputation in this market. Also, there are several large opportunities in the wastewater treatment sector. Several major projects are under tendering, such as North Jeddah wastewater treatment, Lake Musk Sewerage Treatment Project, Hair wastewater treatment in Riyadh, Medina wastewater treatment, and Dammam wastewater treatment.

The following are a list of services and products will be required for future desalination, and wastewater projects to be undertaken in Saudi Arabia.

- Consulting and engineering services
- Anti-scaling Chemicals
- Operations and Maintenance services
- Ro Membranes
- Filters
- Steam & Gas Turbines
- Boilers
- Wastewater Treatment Equipment
- Treatment Chemicals
- Pumps

Opportunities

The government now has more resources to embark on long-planned improvements and a long awaited expansion of water infrastructure, transport and wastewater treatment plants. Over the next five years 2010-2015, Saudi Arabia will require 7,500 km of new pipeline for freshwater transport and over 28,000 km for wastewater disposal pipes. Also, major business opportunities will be forthcoming as the sector opens up for privatization. Industry sources expect that the Government will build more new desalination plants, water pipelines, and wastewater treatment plants on a BOO/BOT basis with the Water & Electricity Company taking the lead. Initially, WEC plans to set up the second group of three IWPP projects with an investment potential of \$6.12 billion. These IWPP projects will provide desalinated water and power to their respective regions.

Resources

- Ministry of Water & Electricity (MOWE)
- Saline Water Conversion Corporation (SWCC)
- Royal Commission for Jubail and Yanbu
- Saudi Aramco
- Power & Water Utility Company for Jubail and Yanbu
- Water & Electricity Company (WEC)
- National Water Company (NWC)

SINGAPORE

Overview

The environmental market in Southeast Asia alone is estimated to hit \$50 billion by the year 2010. Singapore has placed great emphasis in developing the clean technology sector which includes the fields of Clean Energy, the Environment and Water. A holistic blueprint is already in place to grow the Clean Energy industry with \$234 million of public funds. Its initiatives include the \$33 million Clean Energy Research Program (CERP) set up to support R&D efforts as well as a \$17 million graduate scholarship program to groom top-notch talent for the industry.

The water industry has also been identified as a key growth sector for Singapore's economy. The industry is one in which Singapore has a strong interest, given its national emphasis on water management. An additional \$220 million has been committed to develop R&D and manpower capabilities with the aim of positioning Singapore as a Global Hydrohub – an international center to develop and provide water technologies and solutions. The water industry is expected to triple its value-added to the Singapore economy to \$1.1 billion by 2015.

Singapore is also building critical mass in the areas of waste management and recycling. In Singapore, an estimated 760,000 tons of solid waste is generated daily. With only one land-fill site at Pulau Semakau, there is an increased need to look beyond incineration and reduce its reliance on land filling as a key means of managing waste. As such, waste management is one business growth area where Singapore requires good solutions, and where Singapore can serve as a working model and a test bed for new ideas.

Opportunities

Water technologies also offer great opportunities in Singapore. The water industry in Singapore is becoming more liberalized. The national water agency, the Public Utilities Board (PUB), has opened to private companies that want to test-bed projects using its infrastructure. PUB also gives out contracts to private companies to build, design and operate water plants. U.S. companies are

encouraged to participate in future contracts offered by the PUB. American equipment manufacturers could also supply their equipment to the successful prime contractors of PUB projects.

Best Products/Services

- Filtering and purifying machinery and apparatus,
- Technologies involving Wastewater Recycling and Treatment, and
- Modular Wastewater Treatment Systems.

Resources

- Ministry of the Environment & Water Resources <http://www.mewr.gov.sg>
- National Environment Agency <http://www.nea.gov.sg>
- Public Utilities Board <http://www.pub.gov.sg>
- U.S. Commercial Service Ng Haw Cheng, Commercial Specialist Email: Hawcheng.Ng@mail.doc.gov

SLOVENIA

Overview

Slovenia's environmental legislation is harmonized with the European Union, and waste and pollution control mechanisms in Slovenia have improved over the last five years. The major concerns in Slovenia include insufficient level of treatment and coverage for municipal and industrial wastewater; uncontrolled dumping of solid and hazardous wastes; lack of proper disposal sites; lack of recycling facilities and incinerators and control of air pollution emissions in industrial areas. Increase of hazardous waste is of particular concern. In July 2002, Slovenia ratified the Kyoto protocol, according to which Slovenia has to reduce greenhouse gases by 8% between 2008 through 2012.

Slovenia produces 423 kilograms (kg) of waste per capita, which is below the EU-27 average of 526 kg per capita. The majority of the waste is deposited into land fills (330 kg per capita, which is above the EU-27 average of 227 kg per capita). Only 1 kg of waste per capita is actually incinerated, which is drastically below the EU-27 average of 97 kg per capita. (2006 data from statistical portrait 2008)

In 2007, approximately 6 million tons of industrial waste was created in Slovenia, a 2% increase from 2006 data. Processing industries created the largest share (40%); the production of electricity, natural gas, and hot water (26%); construction (22%); and other industries (12%). In 2007, 61% of industrial waste and 42% of all waste was treated.

Best Products/Services

- Waste water treatment

Resources:

- Ministry of Environment, Dunajska 48, SI- 1000 Ljubljana, Slovenia E: [gp.mop\(at\)gov.si](mailto:gp.mop(at)gov.si) <http://www.mop.gov.si/en/>
- Chamber of Commerce and Industry of Slovenia, Dimiceva 13, 1504 Ljubljana, Slovenia E-mail: info@gzs.si <http://eng.gzs.si/slo/>
- U.S. Commercial Service Mr. Matjaž Kavčič, Senior Economic Commercial Specialist e-mail: KavcicM@state.gov

SWEDEN

Overview

The environment is one of the most important issues of our times. Sweden was among the first countries in the world to recognize the growing environmental problems. Swedish environmental technologies and services firms are active in the areas of air pollution, water and waste water treatment, waste management and recycling. Domestic suppliers of pollution control equipment are strong and world leaders in their respective field, but they look for new development in R&D and the application for new techniques. American products enjoy a good reputation on the market but will find strong competition from both domestic firms as well as third-country suppliers.

Best Products/Services

- Products and services related to air pollution control,
- Soil Remediation and
- Waste Management Products/Techniques.

Resources

- Ministry of the Environment www.miljo.regeringen.se
- Swedish Environmental Protection Agency www.environ.se
- Swedish Recycling Industries' Association www.recycling.se
- Swentec - Swedish Environmental Technology Council www.swentec.se
- Avfall Sverige – Swedish Waste Management www.avfallsverige.se
- Varim - Swedish Association of Suppliers of Effluent and Water Treatment Equipment www.varim.se
- Stockholm International Water Institute www.siwi.org
- Stockholm Environment Institute www.sei.se
- Commercial Service Trade Specialist Catharina Kronstrom catharina.kronstrom@mail.doc.gov

TAIWAN

Overview

The government has identified pollution control as an emerging industry, targeting Taiwan to become a major exporter of environmental equipment and services to the Asia Pacific region. In recent years, local manufacturers of pollution control equipment have upgraded their technologies, and their exports have become more strongly competitive. Major foreign suppliers include Japan, Germany, the United States, and South Korea, comprising 73.1% of the import market. In 2006, Japan led the import market, accounting for 33.6% of total imports, followed by the United States with 25.7%, and Germany with 13.8%. Even though local manufacturers supply the majority of the environmental market with low-cost and medium- to high-technology products, the market still relies on foreign suppliers for some advanced environmental technologies.

Best Products/Services

- Ultra pure water equipment
- Process water recycling/reuse equipment
- Precious heavy metal extraction and separation technology
- Advanced wastewater treatment technologies

Opportunities

As Taiwan retains its major manufacturing base for electronics and electrical equipment, advanced pollution control equipment and technologies for the high-tech manufacturing sector will continue to be in great demand. In addition, the six year national plan to increase household connection rates to public sewage systems will continue to increase the demand for advanced wastewater treatment technologies.

Resources

- Environmental Protection Administration (EPA), Executive Yuan:
<http://www.epa.gov.tw> Taiwan Environmental Industry Information Net:
<http://60.248.79.250/e-04envr01-01.asp>
- CS Taiwan Commercial Specialist Allen Chien at Allen.Chien@mail.doc.gov or visit
<http://www.buyusa.gov/taiwan/en/>

TURKEY

Overview

There is a potentially big market for U.S. environmental technology products in the rapidly developing Turkish market. Turkey, despite having a relatively effective environmental law, has not been able to implement environmental protection measures until recently, due to the scarcity of resources and the developing nature of the economy. However, with the start of the accession talks with the European Union, Turkey has adopted a new environmental law to initiate the harmonization of its environmental regulations with EU standards. Alignment with the EU standards is creating an environmental infrastructure and technologies market that will ultimately be worth €70.5 billion. The alignment is planned for completion by 2024.

According to the Ministry of Environment and Forestry, €68 billion of this volume would be spent on capital investment and the rest would be on technical support programs and personnel expenses. The total investment value may increase to €90 billion when the investments required by the ‘chemicals directive’ are added to the total picture.

The amount that would be spent by the state on the capital investment is expected to be around €50 billion, whereas private sector would spend €18 billion. The largest portion of this chain of investment, €35 billion, would be for wastewater and drinking water facilities. This would be followed by investment in solid waste management and prevention of air pollution. As urbanization and industrialization take their toll, problems and needs related to better and more efficient usage of water resources will become more critical.

Currently, annual water use per capita is around 1,500 m³, but in 20 years as the population approaches 90 million people, this amount is expected to go down to 1,042 m³; internationally, 1,000 m³ is accepted as the threshold for the alarm bells to ring. An increase of around 33% in the amount of water drawn from surface and groundwater resources between the years 1995 and 2002 shows that there will be increased pressure on resources in order to meet water demand.

There are some bottlenecks in the water sector that hinder development:

- . Overlap in the responsibilities of different institutions in issuing, monitoring and controlling permits,
- Deficient technical and legal knowledge in local administrations and municipalities,

- Insufficient means to monitor the levels of pollution, and thus, lack of benchmark indicators and numerical environments to devise sound plans,
- Billing problems due to leaks and losses in water pipeline systems,
- Illegal and excess drawing off of groundwater,
- Insufficient sanctions and inspections, and
- Pollution originating from pesticides and fertilizers.

Discharge of sewage and wastewater into surface water without treatment by industrial facilities is also a major problem. There are 87 organized industrial zones in Turkey, but only 41 of them have operating water treatment systems. Seventeen of these zones have connected their sewage systems to the system of the municipality and thus have partially reduced the negative impact they have on environment.

There are 16 metropolitan municipalities with populations greater than 500,000 people 3,200 municipalities with populations lower than 500,000 people, and over 37,000 small towns and villages with populations lower than 2,000 people. The social and economic conditions of their residential units demonstrate wide differences.

According to the results of a survey done by the Turkish Institute of Statistics in 2004 on 1,911 municipalities, it was noted that 1,421 of them had established sewage systems. In that year, 47% of 2.77 billion m³ of waste water drained through these systems was discharged into rivers, 39.3% to sea, 4.2% to dams, 1.9% to lakes and ponds, 1.3% to fields, and 6.3% to other environments. 1.68 billion m³ of this discharged amount was treated in the treatment plants.

The methods used for treatment have been as follows:

- **Biological treatment** (treatment implemented through the use of microbe-size organisms for the removal of organic contaminants in wastewater) – applied to 58.2 percent of the wastewater treated,
- **Physical treatment** (treatment implemented through filters, sedimentation tanks etc) – applied to 28.3% of the wastewater treated, and
- **Advanced treatment** (treatment implemented through advanced methods like biofilters, hybrid reactors, ion exchange, membrane processes etc)– applied to 13.2% of the wastewater treated.

There are 138 treatment plants in Turkey in which secondary and advanced treatment techniques are used, according to the data of 2004. In order to fulfill the requirements of the Urban Wastewater Treatment Directive, approximately 2,942 new treatment plants with various capacities must be built for towns with populations over 2,000. Additionally, in small towns and villages whose population is less than 2,000, appropriate treatment and disposal methods will be implemented as part of the EU acquis.

Agriculture is another important source of water contamination. There are 8.5 million hectares of irrigable land in Turkey. As of January 2005, 4.9 million hectares of this were irrigated. The most important problem with regard to agricultural irrigation in Turkey is lack of drainage systems. The infiltration of fertilizers and plant protection chemicals into the soil through surface irrigation systems could be reduced by treatment of wastewater drained into rivers, the sea etc., by the installation of covered drainage systems, or by the utilization of pressurized irrigation techniques.

Development of municipal water/wastewater treatment is taking place more rapidly than the other areas of environmental protection. There are still thousands of municipalities that do not have

proper water/wastewater treatment systems. Some of the smaller towns, due to their limited financial capability, may not be able to undertake large projects with international players, but there are still cities with 250,000 + populations without a treatment facility.

As far as the treatment of industrial wastewater is concerned, a small portion of industry fully complies with the rules and regulations on treatment of the wastewater generated at their own facilities. U.S. consultancy or equipment manufacturers may find business in this area as well.

Best Products/Services

- Water pumps/filters/pollution control equipment (Turkey has a strong pumps and valves manufacturing base; high-end products could have a better chance in the market),
- SCADA systems
- Design and operation of water/wastewater plants
- Sludge treatment technologies
- Leakage detection systems
- Reverse osmosis
- Membrane technology
- Industrial wastewater remediation systems
- Metering devices

Opportunities

Turkey needs to invest in almost every aspect of environmental technology in the years to come but most heavily in water and wastewater treatment. The fact that government's and municipalities actions towards controlling and preventing pollution creating sources at both municipal level and industrial level will trigger demand for solutions at both service and equipment procurement levels. Especially the following sectors will need to make wastewater treatment investments: textiles, cement, iron/steel, chemicals, food processing, and automotive.

Resources

- Ministry of Environment and Forestry <http://www.cevreorman.gov.tr>
- Istanbul Metropolitan Municipality Department of Environmental Protection & Development <http://www.ibb.gov.tr>
- Istanbul Water and Sewerage Authority – ISKI <http://www.iski.gov.tr>
- Ankara Water and Sewerage Authority – ASKI <http://www.aski.gov.tr>
- Izmir Water and Sewerage Authority – IZSU <http://www.izsu.gov.tr>

IV. Trade Events

Trade events, such as trade shows, trade missions and catalog shows, offer excellent opportunities for face-to-face interaction with foreign buyers and distributors. Of the many U.S. and international events held throughout the year, some are vertical (single industry theme) and some horizontal (many industries represented). The events organized or approved by the U.S. Department of Commerce can be especially useful for first-time or infrequent participants – they require less lead time to register and typically involve more handholding.

The Trade-Event Scheduling Web sites listed below allow selective searches for upcoming events by industry, location, type and date. They typically provide the event organizer, event descriptions and costs, and people to contact for more information. To find upcoming events for U.S. Environmental Technologies, use industry search terms such as environment pollution control or water resources equipment.

Schedules for U.S. Government Organized or Sponsored Events

Domestic USDOC Events: <http://www.export.gov/tradeevents/index.asp>

International USDOC Events <http://www.export.gov/tradeevents/index.asp>

Schedules for Commercially Organized Events

TSNN (<http://www.tsn.com/>)

ExpoWorldNet (<http://www.expoworld.net/>)

Exhibition Center - Foreign Trade Online (<http://www.foreign-trade.com/exhibit.htm>)

Exhibitor Online Trade Show Directory (<http://www.exhibitoronline.com/shows/>)

BizTrade Trade Show Directory (<http://www.biztradeshows.com>)

V. Available Market Research

The reports listed below provide more detailed information about the market for Environmental Technologies in the listed countries, such as demand trends, the competition, business practices, distribution channels, promotional opportunities, and trade barriers. These market research reports are written by resident U.S. commercial staff in each country.

All the reports are accessible on line, at no cost, from
<http://www.buyusainfo.net/adsearch.cfm?loadnav=no>

World Bank Water Market Brief	Multiple Countries	2009
Clean Coal Technology	Australia	6/11/2008
Water Resources Guide for Austria	Austria	7/2/2009
Municipal Water and Wastewater Management	Austria	5/29/2008
Indoor Air Quality Monitoring and Control Equipment	Austria	8/28/2007
The Air Pollution Control Market	Belgium	6/5/2008
The Water and Wastewater Markets	Belgium	6/5/2008
Health Care Waste Treatment	Brazil	6/29/2009
Healthcare Waste Management	Brazil	4/2/2007
Overview of the Water/Waste Water Sector	Bulgaria	2/2/2009
Solid Waste Disposal Equipment	Canada	7/07/2009
Environmental Opportunities in Alberta's Oilsands	Canada	4/17/2009
British Columbia's Environmental Industry Sector	Canada	2/23/2009
Environmental Industry-Wastewater Management	Canada	1/5/2009
Medical Waste Treatment and Disposal Equipment	Canada	7/9/2008
Recycling Initiatives	Canada	5/20/2008
Canada Water Filtration Equipment Industry	Canada	8/27/2008
Water Resources and Equipment	Chile	9/4/2009
Air Pollution Control in Guangdong	China	5/14/2007
Energy Efficiency Market Opportunities	China	7/1/2009
Northeast China: Drinking Water	China	7/27/2009
Water Monitoring Technology and Instruments	China	2/20/2009
Water and Waste Water Market	Czech Republic	1/26/2009
Water and Waste Water Treatment	Denmark	6/3/2008
Air Pollution Reduction Business Opportunities	Egypt	3/27/2007
Environmental Technologies Overview	Finland	7/14/2009
Indoor Air Pollution Control Equipment	France	10/16/2007
Water/Wastewater Treatment Sector	Georgia	2/2/2009
Water Supply and Wastewater Disposal	Germany	8/28/2008
Indoor Air Quality Control Equipment	Greece	12/29/2008
Waste Management Technologies	Greece	2/22/2007
Water Resources Equipment	Hong Kong	3/24/2008
Recycling Market	Hungary	2/7/2008
Water and Wastewater Industry	Hungary	9/9/2008
Water Supply and Distribution Systems Industry	Indonesia	9/29/2008
Soil Remediation Market In Western Japan	Japan	7/22/2009
Abestos Abatement Technologies and Services	Japan	5/31/2009
Water and Wastewater Industry Overview	Japan	5/30/2007
Water and Wastewater Industry	Kenya	6/4/2007
Water and Wastewater Treatment	Malaysia	9/25/2008
Waste Management Equipment Market	Mexico	2/25/2009

Water and Wastewater Equipment and Services Industry	Mexico	5/24/2007
Pollution Control Equipment	Peru	3/6/2007
Water and Wastewater	Romania	5/26/2009
Water Treatment and Wastewater Recycling Systems	Singapore	6/3/2008
Opportunities in Water Treatment	Slovakia	6/9/2008
Air Pollution Control and Monitoring Equipment	Switzerland	8/8/2008
Municipal Wastewater Treatment Facilities	Taiwan	4/30/2009
Water Pollution Control	Thailand	3/1/2007
Water/Wastewater Treatment Sector	Ukraine	2/2/2009
Water Supply Sector	Uzbekistan	2/14/2008
Water and Wastewater Treatment	Vietnam	12/23/2008

APPENDIX

Products in Water Resources Equipment by Schedule B/HS Code (HS 842121 - 11 Items)

Code	Description
842121	Desalters, for water
842121	Dialysis equipment
842121	Filter apparatus, swimming pool
842121	Filtering and purifying machinery and apparatus for liquids
842121	Filtering apparatus, water
842121	Filtering or purifying machinery and apparatus for liquids
842121	Purifying apparatus, liquids
842121	Water desalters
842121	Water filtering apparatus
842121	Water purifying apparatus
842121	Water softening machines

Products in Pollution Control Equipment by Schedule B/HS Code (HS 8421 – 10 Items)

Code	Description
842139	Absorbers, gas or oil
842139	Aeration and mixing units for sewage treatment system
842139	Air filtering equipment
842139	Air Purification Equipment
842139	Catalytic converters, chemical purifiers for gases
842139	Cleaners, air
842139	Degassers
842139	Industrial gas cleaning equipment except electrostatics precipitators
842139	Separating equipment, gas
842139	Parts n.e.s.o.i., for filtering and purifying machinery and Apparatus.

**Products in Water Resources Equipment
by Schedule B/HS Code (HS 8413 - 43 Items)**

CODE	Description
841311	Measuring and dispensing pumps, fuel or lubricant
841311	Pumps for dispensing fuel or lubricants, type used in filling stations or garages
841311	Pumps for liquids, measuring and dispensing
841311	Pumps, lubricant, filling station or garage use
841319	Pumps, liquid, measuring and dispensing, other than filling stations or garage use
841320	Hand pumps, other than those fitted or designed to be fitted with a measuring device
841330	Fuel injection pumps, internal combustion piston engine
841330	Fuel pumps, except fuel injection for internal combustion piston engine
841330	Pumps, fuel injection, automotive internal combustion
841330	Pumps, liquid, except fuel injection, for internal combustion piston engine
841330	Water pumps, automotive
841340	Concrete Pumps
841350	Diaphragm pumps, reciprocating positive displacement
841350	Drainage pumps, (oil cushion) reciprocating positive displacement
841350	Irrigation pumps, (oil cushion) reciprocating positive displacement
841350	Oil field pumps for liquids
841350	Oil well pumps for liquids
841350	Pumps, diaphragm, reciprocating positive displacement
841350	Pumps, for swimming pools
841350	Pumps, oil well and oil field
841350	Pumps, reciprocating, positive displacement
841350	Reciprocating positive displacement pumps
841360	Hydraulic fluid power pumps, rotary, positive displacement
841360	Pumps, roller, positive displacement
841360	Pumps, rotary, positive displacement
841360	Roller pumps, rotary, positive displacement
841360	Rotary positive displacement pumps
841370	Centrifugal pumps for liquids, n.e.s.o.i.
841370	Stock pumps for use with machines for making cellulosic pulp, paper or paperboard
841370	Submersible pumps, centrifugal
841381	Household water systems, self-contained pump
841381	Hydraulic fluid power pumps
841381	Hydraulic fluid power pumps, other than rotary
841381	Pumps, household water, self-contained
841381	Pumps, turbine
841381	Pumps, Windmill
841381	Windmill pumps
841382	Liquid Elevators
841391	Fuel injection pump parts, for compression-ignition engine
841391	Hydraulic fluid power pump parts
841391	Parts, n.e.s.o.i., for pumps
841391	Pumps parts
841392	Parts, n.e.s.o.i., for liquid elevators