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Industrial Market Values in a Changing Energy Environment[©]

Sebastian Rodrigano
Director of Complex Appeals
Popp, Gray & Hutcheson, LLP
Austin, TX 78746
(512) 473-2661
sebastian@property-tax.com

Determining the fair market value of industrial facilities is a complex task. In addition to the typical appraisal parameters, many other variables must be researched and considered. Large scale industrial facilities that compete in the world market for resources and product placement are especially susceptible to changes that may take place half way around the world.

The world is a changing place

For decades the world economy has been centered on the United States and Europe. Even though the population of these areas is relatively small in comparison to the world population, most of the economic activity in the world is based in these areas. Because of their extremely large populations, China and India only require small per capita changes in economic activity to create waves that can shift the world's economy. In the year 2000, China's GDP was roughly a ninth of that of the United States and India's only a twentieth. The European Union was only roughly 500 billion US\$ behind the US (~5%). By the year 2050 China is expected to overtake the US as the number one economy with a GDP exceeding that of the US by over \$9,000 Billion. India's GDP is expected to become roughly 80% of the US GDP. The growth rates required to elevate China and India to these GDP levels from their year 2000 positions (roughly equivalent to those of Italy and Russia for the same year) will undoubtedly be an engine for change that will transform the world economy.

2050 Rank	Country	GDP (Billions US\$)					
		2000	2010	2020	2030	2040	2050
1	China	1,078	2,998	7,070	14,312	26,439	44,453
2	United States	9,825	13,271	16,415	20,833	27,229	35,165
3	India	469	929	2,104	4,935	12,367	27,803
4	Japan	4,176	4,601	5,221	5,810	6,039	6,673
5	Brazil	762	668	1,333	2,189	3,740	6,074
6	Russia	391	847	1,741	2,980	4,467	5,870
7	United Kingdom	1,437	1,876	2,285	2,649	3,201	3,782
8	Germany	1,875	2,212	2,524	2,697	3,147	3,602
9	France	1,311	1,622	1,930	2,267	2,668	3,148
10	Italy	1,078	1,337	1,553	1,671	1,778	2,061
*	European Union	9,395	12,965	16,861	21,075	28,323	35,288

Table 1. GDP projections for top 10 countries and European Union.

Country	Per Capita GDP (\$)		%Change
	2006	2050	
United States	\$44,371	\$87,054	96%
China	\$2,294	\$30,230	1218%
India	\$835	\$17,167	1955%

Table 2. 2006-2050 per capita GDP change projection

While these projections may likely overstate worldwide economic growth, the changes in per capita GDP in Table 2 are likely to maintain their position relative to each other. The energy demands that these changes will require have already begun to alter the world energy market.

Changes in Energy Demand

The Energy Information Administration (EIA) forecasts in its 2008 International Energy Outlook that worldwide energy demand will increase by 50% from 2005 levels: 462 quadrillion British thermal units (BTU) to 563 quadrillion BTU. Emerging economies are expected to increase their demand for energy by 85% during this time period, contrasted to the 19% increase expected for developed nations.

The EIA anticipates that petroleum will remain the world's dominant energy source. Demand for petroleum is expected to grow from an estimated 83.6 million barrels per day (MBPD) to 112.5 MBPD by 2030. The increased demand is expected to be met by increase in output by OPEC producers, and an additional 28.2 MBPD of production are expected.

Natural gas demand is expected to grow from 104 trillion cubic feet (TCF) to 158 TCF in 2030. Natural gas is expected to replace oil when possible, thus pushing the price of natural gas towards its natural 6:1 energetic parity with crude oil. Gas production output is expected to increase throughout the world. It is anticipated that output increases in developing nations where the demand and infrastructure are emerging will be significantly greater than in developed nations.

In conclusion, the US faces tough competition for energy. Satisfying projected energy demand growth will be difficult under the best of scenarios. This situation will present challenges to the US industrial sector that depends on natural gas and oil for fuel as well as raw materials and does not have the potential flexibility that the transportation sector is allowed (i.e. improved fuel efficiencies, alternative fuels).

Effects on the US Industrial Sector

Increasing world wide economic activity is an overall positive for the manufacturing sector. Sales of products should track economic activity, and this will keep the manufacturing sector occupied. However, the lopsided economic growth pattern will undoubtedly bring unprecedented challenges to the US industrial sector. The following are major challenges that can be reasonably expected:

Higher energy costs

As competition for LNG and Middle Eastern crude heats up, prices for these commodities should remain high. This will impact variable costs at manufacturing facilities resulting in higher priced and less competitive products as well as reduced profit margins. This is especially troubling to industries that use natural gas or petroleum as a raw material and as industrial fuel, which in turn affects the secondary industries that depend on their output.

Resource shifts

The increasing difficulty of satisfying the US energy demands will likely require the dedication of additional resources to this activity. Higher cost alternative infrastructure (i.e. coal fired and nuclear power plants) and

additional manpower required in the quest for energy will reduce the amount of resources available to the manufacturing sector.

Consumption patterns changes

Faced with increasing energy costs to support daily activities, US consumers may reduce the amount of demand for many products. This could adversely affect many industries and ripple through the rest of the industrial sector.

Availability of raw materials

For many industries the unprecedented economic growth in China and India may present new challenges in obtaining raw materials to support their activity. This stems from the industrial growth in these areas outpacing the natural resource development that supports it. For example, if China were to consume more than its historical share of copper blister, this may present problems for US copper smelters trying to acquire raw materials and fulfill orders. This problem may then run down the industrial supply chain and affect other industries that consume the smelter's product such as wire manufacturing, which supplies the automotive industry.

Increased overseas competition

As the world prepares for the forecasted economic growth in China and India, industrial capacity is being built in those countries and around the world to support it. From petrochemical projects in the Middle East to millions of barrels per day of new refining capacity to semiconductor manufacturing facilities, billions of dollars are being poured into industrial capacity outside of the US. Industrial growth in the US has not kept pace with this ramp up overseas. If China and India were to consume the totality of the new industrial output, then the US industrial capacity may be somewhat sheltered from competition with the new infrastructure. In reality, demand growth will most likely be cyclical and result in periods of overcapacity for different industrial sectors. When worldwide overcapacity occurs, the higher cost producers lose market share to lower cost producers. This is not favorable for US manufacturing facilities that will have to contend with higher raw material and energy costs as well as higher labor rates than much of the new, overseas capacity.

Effects on Ad Valorem Tax Appraisals

The above discussed issues are likely adversely affect the profitability and marketability of the US industrial infrastructure in the long term. Because of the uncertainty generated by this anticipated major economic shift, acquisition and operation of US industrial facilities is a riskier venture than it has been in the past.

During the rise in the US economy that ended mid 2007, many state and local governments aggressively pursued increases in the valuation of and tax levies on industrial facilities. While this may be warranted under the assumption that output and revenue levels of that time period were to remain constant, in many cases it failed to consider the imminent future challenges these properties face.

In the wake of this uncertainty it is crucial to question the reasons driving revenue increases before assuming that the value of the tangible assets has increased. A number of questions must be raised:

Is the property's current revenue level sustainable?

Are these revenue levels supported by opportunistic contracts or unusual situations that are unlikely to be long lived?

Are other facilities of this type being built in the US?

Are other facilities of this type being built overseas?

Will overseas competition become an issue for this industry, and if so, when?

Are current sales of this type of property driven by historic performance or speculative forecasts?

If the answers to these questions indicate future uncertainty, very careful consideration should be given to the true market value of the property. Simplistic correlations between revenue increases and market values should be avoided as should parallels with highly speculative sales that defy common knowledge about the industry.

In summary, we live in interesting and challenging times and will probably see many changes in the not so distant future. Estimating the future benefit of manufacturing or energy-dependent assets will be increasingly difficult, and therefore establishing fair market values will be a challenging task. Property tax professionals must look at emerging issues with a critical eye and do their best to integrate future challenges facing properties into the valuations upon which those properties will be taxed.

SEBASTIAN RODRIGANO is Director of Complex Appraisal for Popp Gray & Hutcheson, LLP in Austin, Texas. Mr. Rodrigano represents industrial property taxpayers in Texas and other states. For six years prior to joining Popp Gray & Hutcheson, Mr. Rodrigano worked as a complex property appraiser for Capitol Appraisal Group, Inc. and was responsible for the annual reappraisal of over 140 complex properties. Mr. Rodrigano is a native of Argentina, and received his BS in chemical engineering from Texas A&M University in 1999.