Intratec Plant Location Factors User Guide

Introduction

Intratec Plant Location Factors (IL Factors) are multipliers for instantaneously converting construction costs between 36 key countries. They are suitable for industrial processing plants from several sectors. Further details about IL Factors and their methodology can be found at https://intrat.ec/iplf-methodology.

Illustrative Cases

Intratec Plant Location Factors usage is straightforward. To get the plant cost in a country A, multiply the known plant cost in the USA by the country A's factor in the specific period.

*Plant Cost in Country A = Plant Cost in the USA * Country A IL Factor*

You can find below some specific examples on how to correctly use the IL Factors.

Case 1

A research group would like to assess the construction cost of a chlor-alkali plant in April 2017 in Brazil. A similar study was already made in the United States in the same period, and the plant cost was estimated at USD 100 million.

To convert plant cost estimates from the US to Brazil, you just have to multiply the plant cost in April 2017 in the USA (USD 100 million) by the IL Factor Brazil at April 2017 (1.09), as expressed in the equation below:

*Plant Cost in Brazil[Apr 2017] = Plant Cost in the US[Apr 2017] * IL Factor Brazil[Apr 2017]*

By applying this calculation, the plant cost in Brazil in April 2017 would be approximately USD 109 million.

Case 2

A company would like to check the feasibility of a project to construct a polypropylene plant and needs the cost of the plant in January 2016 in Finland. In a recent news, the cost of building a similar plant in Brazil was estimated at USD 500 million in the same month.

Since the IL Factors take a United States-based plant as the reference location, it is necessary to first convert the costs to the US, and then to Brazil.

1. Because you need to convert from the country of the factor (Brazil) to the reference location (United States) and not the other way around, divide the plant cost in January 2016 in Brazil by the IL Factor Brazil in January 2016 (0.94), as expressed in the equation below:

Plant Cost in United States[Jan 2016] = Plant Cost in Brazil[Jan 2016] / IL Factor Brazil[Jan 2016])

The project would cost USD 531.9 million in the United States.

2. To convert plant cost estimates from the US to Finland, you just have to multiply the plant cost in the USA by the IL Factor Finland in January 2016 (1.18), like the equation of Case 1

By applying this calculation, the plant cost in Finland in January 2016 is estimated to be approximately USD 627.6 million.

Case 3

A consulting company was hired to evaluate the performance of a construction project of a fertilizer plant in 2017 in Turkey. After a survey, the consultants discovered that a similar plant cost CNY 5 billion in China in the same year.

1. As the cost reference was estimated for a whole year, it is necessary to change the index frequency. Under the option “Frequency”, choose “Annual” (available in ‘Pro’ and ‘Business’ Plans).

2. To update the plant cost from China to United States, divide the plant cost in 2017 in China by the II Factor China in 2017 (0.82), like the equation of Case 2.

By applying this calculation, the plant cost in the United States in 2017 is estimated to be approximately CNY 6.1 billion.

3. To convert plant cost estimates from the United States to Turkey, you just have to multiply the plant cost in the USA by the IL Factor Turkey in 2017 (0.76), as expressed above.

By applying the calculation, the fertilizer plant construction cost in 2017 would be estimated in approximately CNY 4.63 billion in Turkey.

4. Dividing the value by the exchange rate (6.75 CNY/USD) at the time, it is possible to convert it into dollars. The fertilizer plant would cost USD 687 million.

Application with Plant Construction Indexes

As shown in the examples above, Intratec Plant Location Factors only adjust construction costs over time. If you also need to convert plants capital costs between countries, you can use Intratec Plant Construction Indexes (IC Indexes) in combination with IL Factors.

IC Indexes are multipliers for instantaneously converting construction costs over time. More information on this product is available here.

In the two cases below, you can see how both products are used to convert a plant construction cost over time and between countries.

Case 4

An industry would like to estimate the cost a new refinery in April 2017 in Saudi Arabia. Its first plant cost USD 5 billion in January 2016 in the United States.

1. Initially, the location factor must be used to convert the cost from the United States to Saudi Arabia.

To convert plant cost estimates from the USA to Saudi Arabia, you have to multiply the plant cost in January 2016 in the US by the IL Factor Saudi Arabia in January 2016 (1.13), as described in the cases above.

By applying this calculation, the plant cost in Saudi Arabia in January 2016 would be approximately USD 5.8 billion.

2. Finally, to update the plant cost estimate in Saudi Arabia from January 2016 to April 2017, just multiply the plant cost by the ratio (in USD) of Saudi Arabian IC index in April 2017 (167.2) over the IC index in January 2016 (156.3), as expressed in the equation below:

*Plant Cost[Apr 2017] = Plant Cost[Jan 2016] * (IC Index[Apr 2017] / IC Index[Jan 2016])*

The plant cost in Saudi Arabia in April 2017 would be approximately USD 6.2 billion.

Case 5

A company wants to develop a budget for an ongoing construction project of an oxygen plant in April 2017 in Finland. A consulting firm hired estimated that a similar plant in China cost CNY 40 million in January 2016.

1. First, the location factor must be used to convert the cost from the China to the United States.

To update the plant cost from China to United States, divide the plant cost in January 2016 in China by the II Factor China in January 2016 (0.76), as described in cases 2 and 3.

By applying the calculation, the plant cost in the United States in 2017 is estimated to be approximately CNY 52.6 million.

2. To convert plant cost estimates from the United States to Finland, you just have to multiply the plant cost in the USA by the IL Factor Finland in January 2016 (1.18).

By applying this calculation, the plant cost in Finland in January 2016 would be approximately CNY 62.1 million.

3. To update the plant cost estimate in Finland from January 2016 to April 2017, just multiply the plant cost by the ratio (in CNY) of IC index in April 2017 (129.9) over the IC index in January 2016 (119.6).

The budget of the plant cost in Finland in April 2017 would be approximately CNY 67.5 million.

4. Dividing the budget by the exchange rate (6.89 CNY/USD) at the time, it is possible to convert this value into dollars. The estimated project budget would be USD 9.79 million.

Important Assumptions

Intratec Plant Location Factors track country changes in plant construction costs. Nevertheless, it cannot be applied unthinkingly; there are some considerations and limitations to its use, which were assumed in the 5 cases.

- The cost must be relative to a plant in the same time period and with same capacity. To convert plant cost estimates over time, the Plant Construction Indexes must be used.
- The accuracy of the plant location factors is in line to the inherent error in conceptual studies.
- IL Factors are based on average values. Specific cases may be different from the average.
- Location factors only take into account the relative cost of replicating an industrial plant in another location. They do not consider additional costs caused by unique site conditions.
- Intratec Plant Location Factors are only suitable for processing plants, such as oil refineries, chemical plants, food processing plants, and steel mills.
- IL Factors always take a United States-based plant as the reference location.