

Dynamic Construction Location Factors Update

PEP Review 2026-12

Dr Richard Charlesworth, Global Executive Director, Industry Processes & Cost Analytics

Vipool Bhatt, Associate Director, Industry Processes & Cost Analytics

To learn more or to request a demo, visit www.spglobal.com/energy.

Table of contents

1	Introduction	6
2	PEP Cost Index	7
3	Summary and basis of development	8
4	Approach	16
	Capital cost structure	17
	Information and calculations required for location factor	19
	Steel	20
	Electric	26
	Civil	27
	Equipment	28
	Skilled construction labor	30
	Engineering	34
	Project management	36
	Engineering and project management productivity	38
5	Identical plant calculations	39
	FOB equipment	40
	Material bulk	40
	Labor	40
	Engineering and project management	40
6	Location factor	42
	Scope	43
	Climate	45
	International content	47
	Tariffs and freight	48
	Exchange rates	51
7	Comparison with reported projects	54
	PEP capital cost methodology	54
	Example 1: Hengli, mainland China	56
	Example 2: Dow, Canada	56
	Example 3: Ineos, Belgium	57
8	Data sources	58

Tables

Table 3.1 Location factor estimates for the various countries	10
Table 4.1 Breakdowns in location factor model, in percent	18
Table 4.2 Industry components: PetChem	18
Table 4.3 Steel prices by location	22
Table 4.4 User customization of steel price	25
Table 4.5 Skilled labor wage rate (\$/h)	32
Table 4.6 Project management offshoring, 100% in India (in percent)	35
Table 4.7 Project management offshoring, 60% in India	38
Table 5.1 Location factor subcomponents for mainland China	39
Table 6.1 Three broad categories of project-specific elements	42
Table 6.2 Location factor details	44
Table 6.3 Scope adjustment	45
Table 6.4 Climate adjustment	46
Table 6.5 Location factor	47
Table 6.6 International content	48
Table 6.7 Location factor details vary by tariffs and freight	49
Table 6.8 International content	50

Figures

Figure 2.1 PCI history (Index year 1958 = 100)	7
Figure 3.1 Identical plant	8
Figure 3.2 Layered approach to estimating “project” location factor	9
Figure 3.3 Location factor	9
Figure 4.1 Regional steel price index	20
Figure 4.2 Steel price index by time	21
Figure 4.3 Steel impact on location factor	25
Figure 4.4 Regional electric index	26
Figure 4.5 Electric index by time	27
Figure 4.6 Regional civil cost index	27
Figure 4.7 Civil index by time	28
Figure 4.8 Regional equipment index	29
Figure 4.9 Equipment index by time	29
Figure 4.10 Regional skilled labor index	31
Figure 4.11 Skilled labor by time	31
Figure 4.12 Regional engineering index	34
Figure 4.13 Engineering labor by time	35
Figure 4.14 Resulting location factor	36
Figure 4.15 Regional project management index — Location factor	37
Figure 4.16 Project management effect on location factor index	38
Figure 6.1 Resulting location factor	51
Figure 6.2 Exchange rate — Mexico	51
Figure 6.3 Exchange rate — Mainland China	52
Figure 6.4 Exchange rate — Germany	52
Figure 6.5 Exchange rate — Brazil	53
Figure 7.1 Cost estimate classification system	54
Figure 7.2 PEP definitions of ISBL and OSBL	55
Figure 7.3 Hengli crude oil-to-chemicals overall process configuration	56

Glossary

\$/h	Dollars per hour
DCCI	Downstream Capital Cost Index (S&P Global)
EPC	Engineering, procurement, and construction
EPM	Engineering and product management
h	Hour
ISBL	Inside battery limits
OSBL	Outside battery limits
P&ID	Piping & instrumentation design
PCI	PEP Cost Index
PetChem	Petrochemical
PEP	Process Economics Program
PFD	Process flow diagram
UCCI	Upstream Capital Cost Index (S&P Global)
USGC	US Gulf Coast

Abstract

In our discussions with clients around the world, a topic of continued interest and priority is the variation between construction cost levels in different locations (location factor). To help our customers understand the fundamentals of location factors, we continue to conduct primary market research and develop location factor models and methodology that reflect S&P Global macroeconomics, and the country-specific costs needed to develop relative location factors for the construction of petrochemical, chemical, and refinery plants. The results and methodology were first published in our PEP Report RP204C *Location Factor* (December 2016). In the 2019 PEP Review 2019-12, *Dynamic Construction Location Factors* and accompanying Excel model, we included geographical coverage of 12 locations and enhanced functionality for clients to:

- Estimate a 10-year forward view of location factors.
- Set and/or view scenario conditions (e.g., “test” alternate labor and equipment used in the engineering, procurement, and construction business models/approaches).
- Input the user’s own time series of macroeconomics and cost data.

In this 2026 PEP Review RW2026-12, we have expanded and updated the review to include geographical coverage of 42 locations:

Australia	Italy	Singapore
Austria	Japan	Slovakia
Argentina	Kuwait	Slovenia
Brazil	Malaysia	South Africa
Canada	Mexico	South Korea
Chile	Norway	Taiwan
Mainland China	Nigeria	Thailand
Czech Republic	Oman	Turkey
France	Peru	Ukraine
Germany	Philippines	United Arab Emirates
Hungary	Poland	United Kingdom
India	Qatar	United States
Indonesia	Russia	Venezuela
Iran	Saudi Arabia	Vietnam

Any geography can be set to 1.0 as the basis country. Note that the base case shows location factor subcomponents relative to the US Gulf Coast (USGC). We have also extended the forward view to 2050.

Location factors are **relative** to the USGC, i.e., the USGC is always 1.0. For the changes in absolute construction cost from quarter to quarter, the Process Economics Program (PEP) has its own chemical plant construction cost index, the PEP Cost Index (PCI). This update includes an update of the PCI. In addition, comparisons with actual reported project capital expenditure are provided to validate PEP’s assessments.

Contacts

Dr Richard Charlesworth

Global Executive Director, Industry Processes & Cost Analytics
richard.charlesworth@spglobal.com

Vipool Bhatt

Associate Director, Industry Processes & Cost Analytics
vipool.bhatt@spglobal.com

Rajiv Narang

Executive Director, Global Head, Process Economics Program
rajiv.narang@spglobal.com

CONTACTS

Europe, Middle East, Africa: +44 (0) 203 367 0681

Americas: +1 800 332 6077

Asia-Pacific: +60 4 296 1125

www.spglobal.com/energy

www.spglobal.com/en/enterprise/about/contact-us.html

© 2026 by S&P Global Inc. All rights reserved.

S&P Global, the S&P Global logo, S&P Global Energy, and Platts are trademarks of S&P Global Inc. Permission for any commercial use of these trademarks must be obtained in writing from S&P Global Inc.

You may view or otherwise use the information, prices, indices, assessments and other related information, graphs, tables and images ("Data") in or on this publication only for your personal use or, if you or your company has a license for the Data from S&P Global Energy and you are an authorized user, for your company's internal business use only. You may not publish, reproduce, extract, distribute, retransmit, resell, create any derivative work from, use in any artificial intelligence system, and/or otherwise provide access to the Data or any portion thereof to any person (either within or outside your company, including as part of or via any internal electronic system or intranet), firm or entity, including any subsidiary, parent, or other entity that is affiliated with your company, without S&P Global Energy's prior written consent or as otherwise authorized under license from S&P Global Energy. Any use or distribution of the Data beyond the express uses authorized in this paragraph above is subject to the payment of additional fees to S&P Global Energy.

S&P Global Energy, its affiliates and all of their third-party licensors disclaim any and all warranties, express or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose or use as to the Data, or the results obtained by its use or as to the performance thereof. Data in this publication includes independent and verifiable data collected from actual market participants. Any user of the Data should not rely on any information and/or assessment contained therein in making any investment, trading, risk management or other decision. S&P Global Energy, its affiliates and their third-party licensors do not guarantee the adequacy, accuracy, timeliness and/or completeness of the Data or any component thereof or any communications (whether written, oral, electronic or in other format), and shall not be subject to any damages or liability, including but not limited to any indirect, special, incidental, punitive or consequential damages (including but not limited to, loss of profits, trading losses and loss of goodwill).

ICE index data and NYMEX futures data used herein are provided under S&P Global Energy's commercial licensing agreements with ICE and with NYMEX. You acknowledge that the ICE index data and NYMEX futures data herein are confidential and are proprietary trade secrets and data of ICE and NYMEX or its/their licensors/suppliers, and you shall use best efforts to prevent the unauthorized publication, disclosure or copying of the ICE index data and/or NYMEX futures data.

Permission is granted for those registered with the Copyright Clearance Center (CCC) to copy material above for internal reference or personal use only, provided that appropriate payment is made to the CCC, 222 Rosewood Drive, Danvers, MA 01923, phone +1-978-750-8400. Reproduction in any other form, or for any other purpose, is forbidden without the express prior permission of S&P Global Inc. For article reprints contact: The YGS Group, phone +1-717-505-9701 x105 (800-501-9571 from the U.S.).

For all other queries or requests pursuant to this notice, please contact S&P Global Inc. via email at support.energy@spglobal.com.