

Current Situation and Future Direction of Hot-Dip Galvanized Structural Steel in Thailand

Taweep Chaisomphob¹, Adithep Bunphot², Weerapat Maneenawachai³,

¹Associate Professor, School of Civil Engineering and Technology, Sirindhorn International Institute of Technology, Thammasat University, taweep@siit.tu.ac.th

²⁻³School of Civil Engineering, Faculty of Sirindhorn International Institute of Technology, Thammasat University, Bangkok, Thailand, 5822793584@g.siit.tu.ac.th

Abstract

Thailand main steel consumer sector is construction. From statistic data, it showed that hot-dip galvanized steel industry had been growing along with Thai steel industry. Thailand main hot-dip galvanizing steel product is a hot-dip galvanized steel structure. Its current production increased each year as an average of 3.6% catching construction demand of mega projects. The future demand prediction of this type of steel was estimated to expand in the near future under Eastern Economic Corridor plan and high-voltage transmission line development within the country.

1. Introduction

According to ISIT, the demand break down of steel consumption in Thailand break down into 5 main categories in which construction > automotive > machinery > appliance > packaging respectively range in order. Thai construction industry grows from mega projects implemented by Thai government and other state enterprise investment. This made continuous growth of structural steel demand within the country.

Now a day, Hot-dip galvanized steel starts to pay more role in Thai steel industry as a choice of use for more durable steel structure with zero maintenance which result in lesser life cycle cost [1].

With data support and consultation from THAI GALVANIZING ASSOCIATION (TGA) and IRON & STEEL INSITUTE OF THAILAND (ISIT), the demand prediction and estimation about hot-dip galvanized steel (HDGS) and hot-dip galvanized structural steel (HDGSS) can be made.

2. Current Situation of Thai Steel Industry

The standard demand for steel consumption in Thailand was idealize broken-down by ISIT as construction 60%, automotive 13%, Machinery 11%, appliance 10%, and packaging for 6% [2]. In figure 1, the apparent steel consumption fluctuated each year due to contraction and expansion of the country construction industry as it is the main consumer part in Thai steel industry. In 2019, the apparent steel consumption was estimated to grow by 8.2% due more demand in automotive industry, food packaging, and Thai mega projects construction [3].

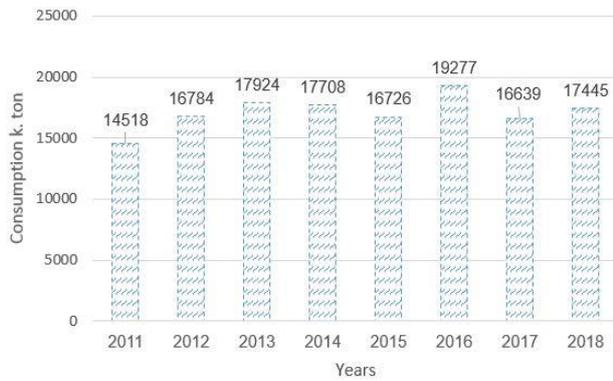


Figure 1, Thai statistical apparent steel consumption

3. The Overall image of hot-dip galvanized steel in Thai steel industry.

In table 1, showing an increase in percentage utilization of steel to be hot-dip galvanized in steel industry. From statistic data, Thailand started to implement more using HDGS as it showed trend of increasing in percentage utilization. This is showing HDGS starts to pay more role in Thai steel industry. However this is based on apparent steel indicator which can only be used as estimation values as Thailand use apparent steel value to predict the steel stock and real consumption in steel industry [2]. In figure 2 show the example of HDGS production by the current highest production output company, Siam Steel Grating. This also prove a growth of HDGS in Thailand by look at a particular company.

Year	Apparent Steel	Hot-Dip galvanized Steel	%
2015	16726	913	5.46
2016	19277	996	5.17
2017	16639	1011	6.08
2018	17445	1066	6.11

Table 1, Percentage of hot-dip galvanized steel in Thai steel industry in kilo ton.

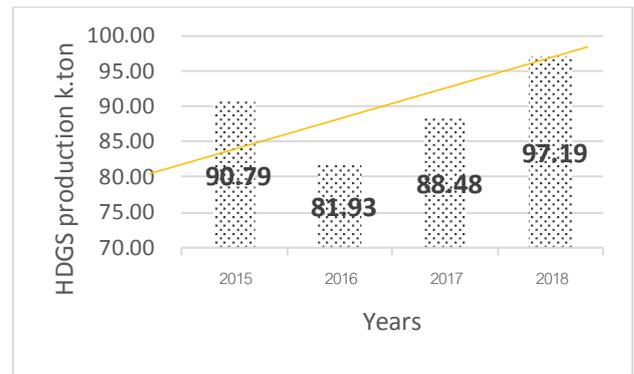


Figure 2, Siam Steel Grating HDGS production

4. Current Thai zinc industry for hot-dip galvanizing

The zinc consumption of steel hot-dip galvanizing industry take about 62% of the total zinc industry consumption in 2018. The percentage by sector in year 2018 are divided in fig 3. The most share percentage is still for structural steel hot-dip galvanizing purpose since 2015-2018 which related to growth of Thai construction industry.

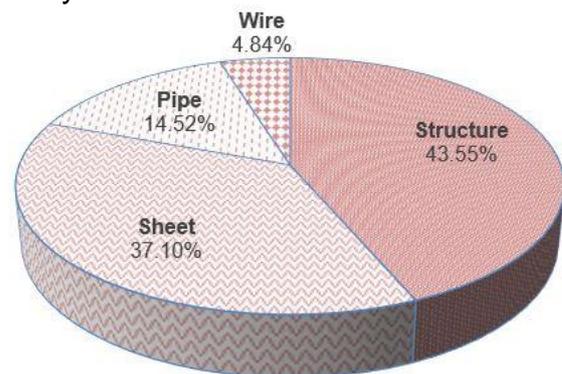


Figure 3, 2018 zinc consumption percentage breakdown for steel hot-dip galvanizing by sectors.

5. Current Thai Hot-Dip Galvanized Structural Steel (HDGSS) demand and future direction.

5.1 Current Situation of HDGSS Demand in Thailand

According to the data collected by TGA, more HDGSS had been producing each year to response to an increasing demand. The data was transformed from 7.5 kg SHG zinc ingot consumption per 100 kg of steel to create 107.5 kg of HDGSS. This ratio is the mean average for HDGSS production. From 2015 to 2018, Thai HDGSS had been increasing with an average growth rate of 3.6% show in figure 4. This was mainly due to feeding of infrastructure demand by Thai mega projects, and expansion and maintenance of high-voltage transmission line as well as small portions from private business sector investment which showed expansion each year. The current consumption of HDGSS per capita in 2018 are 6.89 kg which increase from 2017 by 7.8%.

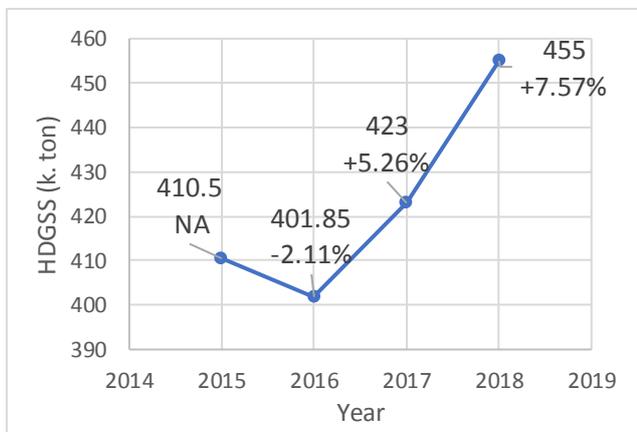


Figure 4, Thai statistical HDGSS annual production

5.2 Future Direction of HDGSS Demand in Thailand

Thai HDGSS market mainly gets boosted by infrastructure and transportation connectivity construction of Thai mega project implemented by government and development of transmission line system projects by Electricity Generating Authority of Thailand (EGAT). HDGSS consumption by local private sectors are still less in value but observed to increase overtime by HDGSS producers. The current most paid

attention mega project in Thailand is Eastern Economic Corridor (EEC) which aim to improve the country economic under a strategy of Thailand 4.0 [4]. It contains 6 plans with 168 sub mega project for the grand total budget of 28 billion USD as stated in figure 5 [5]. To serve this construction continuity from 2015 - 2022 and beyond, HDGSS will always be needed for corrosion-resistant steel structure, light-pole, guard rail, pipe (water, chemical supply line), etc. The future expansion of Transmission line by EGAT as well has been boosting the HDGSS consumption. There are 20 current projects in hand (some are already in progress and likely to finish in the near future) with grand total budget of 12.7 Billion USD. The consumption of HDGSS are in construction of high-voltage line of 14700 circuit-kilometer, expansion of current substations, and new substations [6]. From these stated HDGSS consumption will likely in an increasing trend as construction project plans always develop and corrosion-resistant steel structure are needed in those projects.

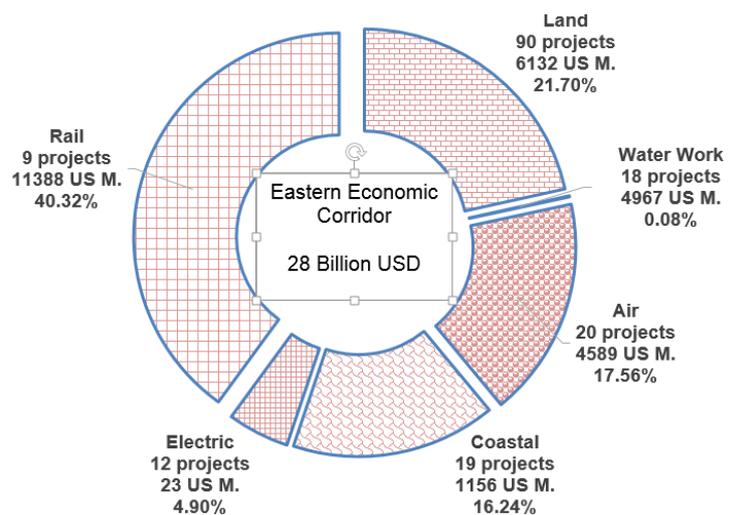


Figure 5, Eastern Economic Corridor (EEC) investment by sector.

6. Conclusion

Construction industry is the most steel consumer in Thai steel industry. From numeric analysis in statistic data, hot-dip

galvanized steel accounted as an average of 5% from total steel consumption which using Thai apparent steel consumption as an indicator. It projected an increasing trend along with the apparent steel consumption. The current most hot-dip galvanizing product in Thailand base on SHG zinc ingot consumption for hot-dip galvanizing is structural steel. The annual production data of hot-dip galvanized structural steel gathered from TGA develop each year showing an expanding demand market of using it. The average growth was predicted to grown around 3.6% from 4 years statistic data. The main markets using HDGSS are infrastructure and transportation connectivity constructions by Thai mega projects as well as the development of high-voltage transmission line projects within the country. Some projects still had been doing and will be finished in the near future. Some future projects plan also have been developed. The prediction and conclusion to the near future is that the demand for the hot-dip galvanized structural steel in Thailand will expand related to growth of construction industry which boosts its consumption.

Acknowledgement

The authors would like to thank Mr. Tuangpoom Sataranuwat (managing director of UNION GALVANIZEER CO., LTD and as a member of TGA), TGA, and ISIT for consulting problem and data support.

Reference

In section 3, SHG zinc ingot data from Phadaeng Industry were transformed to be HDGSS. The HDGS production of Siam Steel Grating was obtained from the company.

In section 4, the zinc industry data obtained from Phadaeng Industry.

In section 5, The HDGSS production are information from TGA.

[1] About Galvanize. Retrieve 27 June, 2019, from <http://www.hdgthai.org/web/why-galvanize.html>

[2] Benefit of using SWIP Index in order to estimate steel stock of Thailand, September 2552, Page 1, Page 2, IRON & STEEL INSTITUTE OF THAILAND, <http://www.isit.or.th/uploads/Marketstudy/3-file.pdf>

[3] Thai steel industry situation report 2018, IRON & STEEL INTELLIGENCE UNIT, Page 14, <http://iiu.isit.or.th/th/reports/Yearly%20Report/download.aspx?Content=3420>

[4] What is EEC, Retrieve 24 June, 2019, from <https://sites.google.com/site/bbboseec/1-eec-khux-xari>

[5] Mega Projects to Drive Thailand's Economic Growth, Pailin Chuchottaworn, March 19, 2018, Page 22

[6] Construction and maintenance of transmission line, Retrieve 27 June, 2019, from http://www.egat.co.th/index.php?option=com_content&view=article&id=2203&Itemid=215