Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.090

# Managing Better Net Working Capital With Data Assumption from Financial Statements in Manufacturing And Energy Companies-case in Emerging Markets Including Vietnam

HOANG THANH HANH*

PhD, Academy of Finance, Vietnam
corresponding author:
Email: hoangthanhhanh@hvtc.edu.vn

**Abstract:** In emerging markets in Asia including Vietnam, environment protection has been becoming meaningful in the context of global warming. There area huge number of used tires in region every year; so, pyrolysis firms have updated new technology to solve this environmental issue.

That's why it is important for us to consider solutions for better management of net working capital (including inventory for waste tires, for output products such as fuel oil, carbon black, steel). with all data collected from financial statements of energy firms. From financial reports on current business operation, we can make assumptions for input data of working capital.

Hence, This paper will use statistic methods, together with practical experience in an energy firm case in one of developing countries in Asia, Vietnam.

Finally, we think it is important to suggest some plans for better management of net working capital in this renewable energy business sector. This is a vital part of financial management mission in the business and in functions of CFOs and financial accounting team.

**JEL classification numbers:** G00, G390

**Keywords:** managing net working capital, financial statement data, financial management, policy

## INTRODUCTION

In manufacturing companies such as energy firms, Net working capital will comprise of : Reserves for inventory, Account receivables, Account payables. Inventory might consits of materials (waste tires) and finished products (FO-R oil, carbon black and scrap steel).

Some Vietnamese companies have successfully applied pyrolysis to get fuel and energy such as Nguyen Tai Energy Company - which has a fuel distillation system and a waste treatment system to generate electricity in Binh Phuoc. , Kala Glass Manufacturing Corporation (Kien An, Hai Phong City), MPA VIETNAM Company (Vietnam Industrial Park - Singapore Industrial Park, Binh Duong) Bien Hoa Chemical Factory in Dong Nai Province ...

In recent years,there are traditional pyrolysis method versus continuous pyrolysis method used in many nations in the world.

The pyrolysis technology does not spread dust into the surrounding environment such as coal-fired furnaces, less smoke compared to diesel burning and the burning smell of rubber is almost controlled by the process of pyrolysis of rubber waste evenly in the environment. vacuum. This is a technology that has made great strides in the energy field. It solves the problem that causes the authorities to have a headache about the oil and coal fuel sources that are exhausted.

We will structure the study as below: session 1 and 2 will cover introduction, scope of study, previous studies, concepts and method. Next sessions give us main results, some discussion, conclusion and policy implications.

## PREVIOUS STUDIES

### Research Issues

This paper will address important issues of financial management, esp. In managing better net working capital from financial statement data, in waste tire pyrolysis firms, and suggestions for TQM

### Literature review

The energy sector plays an important role in Vietnam's continued development, and access to reliable energy sources, reducing costs, will be a key factor for sustainable economic growth. Achieving the global green house

emission reduction target as set out in the Paris Agreement on climate change will depend heavily on the development path of developing economies like Vietnam.

Kalitko (2012) has shown the process of pyrolysis of waste tires by thermal recycling by heating at high temperatures (500 degree C) which will generate FO-R oil (liquid) and carbon black with yields of 50% and 35% correspondingly, at the same time generating gas residual (about 10%) after oil condensing and the rest product is scrap steel (wire) 5%. Williams (2013) mentioned that oil pyrolysis is a complex chemical process in which it contains aliphatic as well as polar fractions. The fuel properties of pyrolysis oil are similar to that of gas oil or fuel oil heated in a thermal furnace.

Main gas products produced in the pyrolysis process consist of H2, C1–C4 hydrocarbons, CO2, CO and H2S. The pyrolysis products from waste tires can be raised to higher grade products with high value on char upgrading, for example better qualified carbon black.

Then, Rani S.., and Agnihotri R., (2014) also indicated pyrolysis or waste tire recycling process generating comparative efficiency compared with diesel oil while having some questions of stages of desulfurization. Desulfurization proces indicated better oil quality with viscosity decrease, so it is potential to replace for diesel.

Elshokary S. et all (2018) presented a variety of pyrolysis information with the reactors accompanied with testing conditions such as temperature, rate of heat, type of catalyst and impacts on pyrolysis final products.

Last but not least, Han J. et all (2018) concluded that process of pyrolyssis can be
divided into 4 phases with changing temperature: below 320 °C (water vaporization), at 320–400 °C (natural rubber decomposition), it will happen at 400–520 °C (synthetic rubber decomposition), and above 520 °C.

Then, Anh Tuan et al. (2020) pointed scrap tire is popular in global and ST pyroysis is good way to decompose rubber without oxygen, at high temperature.

**Description of Waste tire pyrolysis system**

**(Output) products: fuel oil renewable, carbon, steel**

The yield for each outputs are : Fuel oil renewable(42%), for carbon black (35%) and for scrap steel (15%). Cement or glass firms are popular clients of FO-R oil.

FO-R oil is the main product in the production of fuel from scrap rubber by pyrolysis technology. FO-R oil meets the combustion fuel standards of Vietnam TCVN 6239: 2002. The quality according to FO-R fuel oil is equivalent to DO (Diesel Oil) and better than conventional FO (Fuel Oils), many of FO-R's parameters are very good such as heat, closed cup burning point, freezing temperature ... FO-R oil is suitable as furnace fuel for production fields such as: Asphalt mixing plant, boiler, kiln, hot asphalt concrete, glass, glass, ceramics, cooking copper and aluminum ... Using FO-R oil as a replacement fuel for DO and FO oil will be very effective when it can save up to 20% of total fuel cost; On the other hand, when converting to use FO-R fuel, the incinerator system does not need to be changed or modified, FO-R oil can be used easily with all existing incinerators on the market. FO-R is not only up to the standard of combustion techniques but also better in the environment, using FO-R instead of conventional FO will contribute to minimizing air pollution and minimizing the amount of waste rubber that causes pollution. environmental contamination. With superior quality than conventional FO, FO-R has been asserting its leading position in the fuel market. Customer businesses that use FO-R oil not only bring about technical and economic efficiency, but also create a green, environmentally friendly image for their customers.

**TQM's comprehensive quality management goal**

Every people and every aspects of organization should join TQM process.

- Quality team activities.

Members of binoculars belong to the same department. Through the quality team related problems are solved and suggestions for improvement are passed on to company management.

- Project groups

Members of this group come from different divisions and are ranked higher than members of the quality team. Formed to address a particular problem.

**Methodology**

We perform both fundamental data analysis and qualitative methods such as statistics, analysis and synthesis based on a practical Vietnam case.

Not only we use qualitative analysis with dialectical materialism method, we use case analysis in Vietnam as well. An quality approach is used as well to enhance solutions.

Based on Vietnam case analysis and other countries, we propose some proper policies for enterprises and government.

## RESULTS

### Overview

In pyrolysis firms, we nee to estimate working capital for projects into operation well, with assumptions: yield 45% for FO-R oil, 41% for carbon black and 15% for scrap steel, inventory time (oil): 32,9 days, account receivables time: 30 days.

### Key findings

A) Financial management for input material (waste tires)

Look at the below table 1, we need to control the purchasing of input (waste tires). Also, we could replace waste tires by using other plastic products, nylon, etc. To increase the output volumn of FO-R oil. We need capitals form banks and funds to build a warehouse that can care a big volumn of waste tires purchased every week from all cities and provinces in the nation. Beside, the bigger the size of waste tires , the more output oil will be produced.

Input data we can make assumptions from current data on financial statement and business of the energy firm.

**Table 1 : Days in inventory (input and output)**

| No | Estimate NWC change | Day | Unit | | | |
|---|---|---|---|---|---|---|
| 1 | Inventory (Oil) - days | 32.9 | days | | | |
| 2 | Inventory (Waste tire) - days | | days | | | |
| 3 | A/R Days | 30 | days | | | |
| 4 | Inventory turnover (Oil) | 11.1 | circle/year | | | |
| 5 | Inventory turnover (Waste tire) | | circle/year | | | |
| 6 | A/R turnover | 12 | circle/year | | | |
| 7 | A/P days | 0 | immediate payment | | | |

B) To estimate exaclt how much workign cpaital needed, we need to know pyrolysis yield as below table :

| | **Table 2 - Pyrolysis efficiency** | | | | | |
|---|---|---|---|---|---|---|
| | **ITEM** | | **Capacity** | **Wasted tires** | **Cut tires** | |
| 1 | **Tires-used (tons/line)** | | **17.65** | 100% | | |
| 2 | Cut tires per line | | **15.00** | 85% | 100% | |
| 3 | FO-R Oil | | | 38.25 % | 45% | |
| 4 | Carbon black | | | 34.85 % | 41% | |
| 5 | Scrap steel | | | 15% | | |
| 6 | Gas | | | 11.9 % | 14% | |
| | | | | | | |

B) Estimating net working capital for pyrolysis technology

Though we present a net working capital (NWC) model below for Vietnam, other emerging markets can use it as reference.

In this model, we can recognize the better the technology process, the more output products generated (oil, carbon black). And the more revenues and profits for pyrolysis firms.

Table 3- NWC projection

| | Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2,027 | 2028 | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Operating capacity of the plant | - | 25% | 75% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | | **73%** |
| 2 | Net sales | - | 9,334,673 | 28,797,819 | 35,986,223 | 36,462,503 | 36,462,503 | 36,462,503 | 36,462,503 | 36,462,503 | 36,462,503 | | **292,893,730** |
| 3 | Cost of good sold | - | 4,416,513 | 11,300,484 | 14,572,860 | 14,572,860 | 14,572,860 | 14,572,860 | 14,572,860 | 14,572,860 | 14,572,860 | | **117,727,019** |
| 4 | Cost of waste tires | - | | | | | | | | | | | |
| 5 | Inventory quantity (waste tire) | - | | | | | | | | | | | |
| 6 | Inventory (waste tire) | - | | | | | | | | | | | |
| 7 | Inventory quantity (oil) | - | 1,555 | 4,664 | 5,596 | 5,596 | 5,596 | 5,596 | 5,596 | 5,596 | 5,596 | | **4,539** |
| 8 | Inventory (oil) | - | 394,889 | 1,184,668 | 1,421,601 | 1,421,601 | 1,421,601 | 1,421,601 | 1,421,601 | 1,421,601 | 1,421,601 | | **11,530,765** |
| 9 | Account Receivables | - | 767,233 | 2,366,944 | 2,957,772 | 2,996,918 | 2,996,918 | 2,996,918 | 2,996,918 | 2,996,918.02 | 2,996,918 | | **24,073,457** |
| 10 | Net working capital | - | 1,162,123 | 3,551,612 | 4,379,373 | 4,418,519 | 4,418,519 | 4,418,519 | 4,418,519 | 4,418,519 | 4,418,519 | | **35,604,222** |
| 11 | Change in Net working capital | - | 1,162,123 | 2,389,489 | 827,761 | 39,146 | - | - | - | - | - | | **4,418,519** |

The above data generates some below comments:
2.5 months: time for initial working capital used in calculating waste tire (inventory). From inventory (oil) and account receivables: calculate change in NWC.
Sub to firm strategy, we cn cover NWC into total investment capital. From the above table, we can see the amount of Working cap. We have to borrow from banks or funds under short term borrowings (1 year).
In general, the ratio of output products can increase with new technology and better pyrolysis lines.

**DISCUSSION FOR FURTHER RESEARCHES**

For material risk; we need to sign long term contracts with suppliers.
Next, In our current conditions, we highly value middle financial accounting managers duties and roles and functions. They will help our firms to conduct training, perform control over inventories, assets and A/R or A/P accounts.

## CONCLUSION AND POLICY SUGGESTION

**For better net working capital management we suggest that:**

- Inventory management

You need to define inventory levels that allow uninterrupted production while reducing your raw material investment, increasing cash flow. In addition, finished goods must be kept to a minimum to avoid overproduction.

-Accounts receivable management

Most customers want to extend the payment period, so it is necessary to define an appropriate credit policy so that the company can collect money on bills or debts due.

## ACKNOWLEDGEMENTS

I would like to take this opportunity to express my warm thanks to Board of Editors, my family, colleagues, and brother in assisting convenient conditions for my research paper.

## REFERENCES

1. Elshokary S, Faraga S, Abuelyazeed O, Hurisso B, and Ismail M (2018), Upgrading of Waste Tiers Pyrolysis Product: State-of-the-Art, International Journal of Waste Resources, 8(4)
2. Anh Tuan, H., Tuan Hai., N., & Hoang Phuong, N. (2020). Scrap tire pyrolysis as a potential strategy for waste management pathway: a review, Energy Sources, Part A.
3. Han J, Li W, Liu D, Qin L, Chen W, and Xing F (2018), Pyrolysis characteristic and mechanism of waste tyre: A thermogravimetry-mass spectrometry analysis, Journal of Analytical and Applied Pyrolysis, 129: 1-5
4. M. P. Hirenkumar, and M.P. Tushar (2012), Emission Analysis of a Single Cylinder Fuelled with Pyrolysis Oil Diesel and its Blend with Ethanol, IJEST , 4: 2834 -2838
5. Murena, F. (1996). Hydrogenative pyrolysis of waste tires, Journal of Hazardous Materials, Volume 50, Issue 1, September 1996, Pages 79-98
6. Rani S, and Agnihotr R (2014), Recycling of Scrap Tyres, International Journal of Materials Science and Applications, 3: 164-167
7. Roy C, Chaala A, and Darmstadt H (1998), The Vacuum Pyrolysis of Used Tyres End use of oil and carbon black product, Journal of Analytical and Applied Pyrolysis, 51: 201-221
8. Williams, P/T. (2013). Pyrolysis of waste tyres: A review, Waste Management, 33(8): 1714-1728. https://doi.org/10.1016/j.wasman.2013.05.003

**Website**

**https://ramboll.com/services-and-sectors/energy/waste-to-energy**

**https://masdar.ae/en/masdar-clean-energy/technologies/waste-to-energy**

**Exhibit**

Exhibit 1 – Loan/Credit growth rate in the past years (2012-2018) in Vietnam