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USAID Private Financing Advisory Network-Asia (PFAN-Asia) Program

# THE BUSINESS CASE FOR: ENERGY EFFICIENCY IN VIETNAM'S TEXTILE INDUSTRY



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*“Improving energy efficiency is critical for Vietnam’s ability to meet energy demand to power growth and maintain improvements in welfare.”*

**-Victoria Kwakwa**, Country Director for the World Bank in Vietnam

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## List of Abbreviations

ESCO	Energy Service Companies
IEE	Industrial Energy Efficiency
MOIT	Ministry of Industry and Trade Vietnam
PFAN-Asia	Private Financing Advisory Network-Asia
RE	Renewable Energy
SME	Small and Medium Enterprise
T&G	Textile and Garment
USAID	United State Agency for International Development
VITAS	Vietnam Textile and Apparel Association

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## Executive Summary

With annual turnover of US\$ 20 billion, equivalent to 15% of the country's GDP, the textile industry is the second leading export sector in Vietnam after crude oil. Vietnam's Ministry of Industry and Trade (MOIT) estimates that energy costs in the Textile & Garment (T&G) industry are approximately 12% of the total production costs, or close to US\$ 3 billion per a year. However, there remain significant opportunities to reduce energy costs by improving energy efficiency through a combination of equipment replacement, usage management, and other measures, representing savings **up to 30%** as estimated by MOIT. Therefore, efficiently managing energy consumption in T&G plants could result in savings of nearly US\$ 1 billion, **effectively doubling the industry's current gross profit** (see Page 6).

Growing evidence from international practices has shown that opportunities for energy efficiency improvements in textile plants are many and rich. Up-front costs typically range between of \$110,000 and \$300,000, with annual savings typically between the range of \$230,000 and \$730,000, resulting in a payback period that can be **less than a year** and feature comparable ROI to other facility investments (see Page 8).

Vietnamese T&G plants are major energy consumers that are well placed to benefit from Industrial Energy Efficiency (IEE) measures that will lower their overall energy consumption. Doing so not only provides significant benefits today through the reduction of operating costs, but also protection against future risks by mitigating factors such as increasing energy costs and grid reliability.

As part of its regional efforts to increase investments in clean energy and combat global climate change, The United States Agency for International Development's (USAID) regional Private Financing Advisory Network-Asia (PFAN-Asia) program assists businesses in Asia's developing countries to mobilize and scale up investments in clean energy, including energy efficiency projects in Vietnam's T&G industry. Featuring a roster of highly experienced mentors and an extensive network of investors, PFAN-Asia is well positioned to support interested parties in raising capital with a range of services that include strategic advisory and mentoring on the preparation and refinement of IEE proposals as well as other related documentation necessary for investor outreach.

For further information regarding this report, please contact the author at PFAN-Asia (see Page 1).

## 1. Industry Background

Vietnam's T&G sector has seen fast and sustainable growth over the past few years, playing an important role in national socio-economic development and in the global textile market. With annual turnover of over US\$ 20 billion, equivalent to 15% of the country's GDP<sup>1</sup>, the textile industry is the second leading export sector in Vietnam after crude oil. Vietnam's T&G industry ranks fifth worldwide in textile exports and employs approximately 2.5 million people<sup>2</sup> – or nearly 2.8% of the entire population.

T&G is the oldest industry in Vietnam, with the majority of plants in the small and medium range (85%)<sup>3</sup>. Many plants operate as subcontractors for corporate buyers in the global supply chain, using imported inputs (cotton, fiber, fabrics and other materials) and machinery, and serving many of the most well-known labels worldwide (see Exhibit 2). Despite the recent global economic downturn, the sector has continued to see impressive export performance. Export revenue exceeded US\$20 billion in 2013, up 18% from 2012. The main export markets for Vietnam are: The United States, which accounted for \$8.55 billion of those exports; the European Union, with \$2.66 billion; and Japan, with \$2.39 billion<sup>4</sup>.

Exhibit 1 Vietnamese T&G Industry

TEXTILE INDUSTRY SNAPSHOT	YEAR 2013
# OF ENTERPRISES	5,982
# EMPLOYED	2.5 million people
TOTAL REVENUE	US\$ 24.9B
EXPORT REVENUE	US\$ 20.1B
GROSS PROFIT	US\$ 1.1B

Exhibit 2 Major Buyers Importing from Vietnamese Garment Plants



Source VITAS

## 2. Energy Usage in Vietnamese T&G Plants

While many of the larger Vietnamese T&G plants are partially owned by the government and have invested in technology to improve overall quality and efficiency, many small and medium enterprises (SMEs) have not followed suit and continue to employ outdated technology from the 1960s and 1970s. Approximately 50% of the equipment in the Vietnamese T&G industry has been used for over 20 years<sup>5</sup>, which is substantially longer than what is used in similar factories in competing countries such as Thailand and China<sup>6</sup>. This largely antiquated production system contributes to poor energy efficiency, resulting in Vietnam's T&G industry possessing one of the very lowest energy utilization ratings<sup>7</sup>.

<sup>1</sup> Vietnam GDP 2013-US\$ 117.4 billion (Source: World Bank 2013 <http://www.worldbank.org/en/country/vietnam>)

<sup>2</sup> VITAS- Vietnam Textile and Garment Association, 2014. Special Report (*in Vietnamese*). <http://www.vietnamtextile.org.vn/Uploads/documents/Bantin/Ban%20tin%20Tet%202014.pdf>.

<sup>3</sup> General Statistics Office of Viet Nam. 2014. Statistical Yearbook of Vietnam 2013.

<sup>4</sup> MOIT, 2014. Foreign Garment and Textile Manufacturers Weave Their Way to Success in Viet Nam.

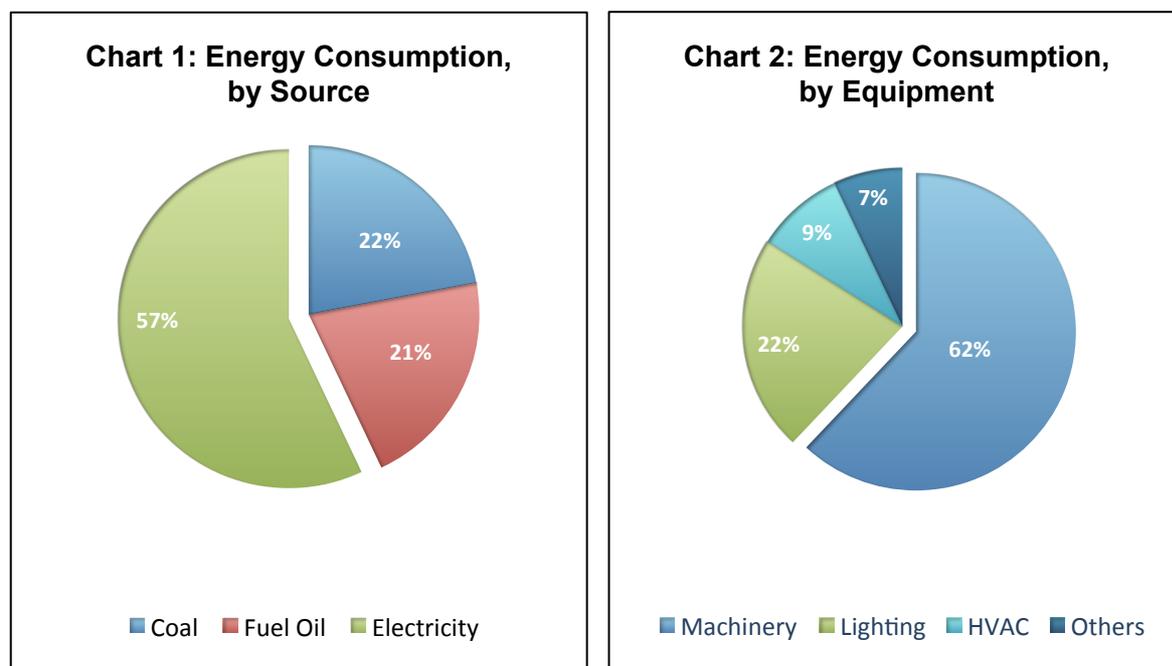
<http://www.moit.gov.vn/en/News/645/foreign-garment-and-textile-manufacturers-weave-their-way-to-success-in-viet-nam.aspx>

<sup>5</sup> Nguyen, Phung Loan.2004. "The Status and Environmental Problems of Textile Industry in Vietnam", <http://edepot.wur.nl/32781>.

<sup>6</sup> MOIT. 2011. Textile companies seeking ways to save energy. <http://tietkiemnangluong.com.vn/en/hot-news/textile-companies-seeking-ways-to-save-energy-42003-11413.html>.

<sup>7</sup> Ibid.

Overall, energy costs in Vietnamese T&G plants are higher than other Asian countries. In Thailand, energy costs account for only 6-7% of production costs, compared to 10-12%<sup>8</sup> in Vietnam. At this cost, the Vietnam T&G industry pays close to **US\$ 3 billion** annually for its energy bills (based on the Industry Income Statement of 2013). In some Vietnamese plants, according to the study by Drejet and Rappaport (2014), the energy costs are even higher with **electricity costs at 33.7% and fuel at 21.9%**.



Source: VITAS 2014

MOIT estimates that energy saving potential for T&G industry is up to 30%. Therefore, efficiently managing energy consumption in T&G plants could save approximately US\$ 1 billion, **effectively doubling the industry's gross profit** (see *Exhibit 3*).

### Exhibit 3 Industry Income Statement with 30% of Energy Savings

Textile Industry Income Statement YEAR 2013	US\$ Billion	Percentage	With 30% Energy Savings
<b>Revenue</b>	<b>24.9</b>		<b>24.9</b>
<b>Cost of Sales</b>	<b>23.8</b>	<b>100%</b>	<b>23.1</b>
- Raw Materials	10.7	45%	10.7
- Labor	4.9	20%	4.9
- Logistics	3.3	14%	3.3
- Energy costs	2.9	12%	2
- Other	2.1	9%	2.1
<b>Gross Profit</b>	<b>1.1</b>		<b>1.8</b>

\*PFAN-Asia calculates from various sources

<sup>8</sup> MOIT. 2011. Textile companies seeking ways to save energy. <http://tietkiemnangluong.com.vn/en/hot-news/textile-companies-seeking-ways-to-save-energy-42003-11413.html>

### 3. Energy Efficiency - A Strong Strategy

Improving energy efficiency reduces energy costs and results in lower costs of production, thus improving competitive pricing and increasing market share while also freeing capital for new product development and/or other facility investments.

Since energy prices in Vietnam are currently below the actual cost of generation due to heavy subsidies from the Government, reducing energy consumption is also a hedge against inevitable future energy price increases. Vietnam's Electricity Retail Price in August, 2013 was \$ 7 cent per kilowatt hour<sup>9</sup>. The country's Prime Minister approved an increase in the tariff last year to a maximum of \$ 9 cent per kilowatt hour by 2015<sup>10</sup>, and it will likely rise further still in the years ahead.

The benefits of Industrial Energy Efficiency (IEE) measures are clear, immediate, and represent a sound investment strategy. Growing evidence from international practices has shown that opportunities for energy efficiency improvements in textile plants are many and rich. Up-front costs typically range between **\$110,000 and \$300,000**, and savings are typically between **\$230,000 and \$730,000** per year. Payback can be as short as under a year, and ROI is comparable to other facility investments (see *Exhibit 5*).

In addition to resource productivity, IEE measures can also contribute to **corporate social responsibility**. The study by Drejet and Rappaport (2014) in Vietnamese apparel factories found that better working conditions for employees is correlated to higher energy efficiency and, therefore, supporting such factories can bring a number of indirect benefits. After all, a focus on **improving health and safety for workers** via support for factories that are well-managed and energy efficient presents a positive contrast to events such as the collapse last year of a poorly built garment factory in Bangladesh.<sup>11</sup>

### 4. Case Study: NRDC's 10 Best Practices

The Natural Resources Defense Council (NRDC), an American NGO, has developed a number of practical, low-cost energy efficiency measures for textile factories that feature return on investment in less than one year. The NRDC's measures focused on the following areas of operations:

- ✓ Recover heat from hot air
- ✓ Recover heat from hot water
- ✓ Maintain steam traps and steam system
- ✓ Improve boiler efficiency
- ✓ Insulate equipment and tanks

As part of a pilot study, twenty-two textile mills in China and four in Bangladesh joined the NRDC to implement these modifications and assess their impact. Two years after implementation, the participating factories saved up to US\$ 730,000 annually, on average. The table below lists, in detail, the various energy efficiency investments undertaken alongside their associated cost, savings, and payback period.

<sup>9</sup> VPBS. 2013. Vietnam Power Industry <https://vpbs.com.vn/Handlers/DownloadReport.ashx?ReportID=1867>

<sup>10</sup> Bloomberg News. 2013. Vietnam Faces Growing Threat of Power Blackouts: Southeast Asia.

<http://www.bloomberg.com/news/2013-12-05/vietnam-faces-growing-threat-of-power-blackouts-southeast-asia.html>

<sup>11</sup> BBC News. Bangladesh factory collapse toll passes 1,000. <http://www.bbc.com/news/world-asia-22476774>

Practice	Cost	Savings (US\$)	Payback Period
Fuel savings from leak detection, preventive, maintenance, improved cleaning	Insignificant	<\$1,000-\$20,000	<1month
Reuse cooling water	\$2,000-\$3,000	\$2,000-\$18,000	2-7 months
Reuse condensate	\$12,000-33,000	\$8,000-\$78,000	4-18 months
Reuse process water	<\$1,000-24,000	\$6,000-\$48,000	1-10 months
Recover heat from hot water	\$35,000-\$79,000	\$119,000-\$265,000	4-7 months
Improving boiler efficiency			
Prescreen coal	\$12,000-\$22,000	\$23,000-\$49,000	6-9 months
Insulate boiler and economizer	\$5,000-\$6,000	\$10,000-\$18,000	4-8 months
Maintain steam traps and system			
Maintain steam traps	\$2,000-\$5,000	\$7,000-\$28,000	2-6 months
Repair steam leaks	\$0-\$1,000	\$4,000-\$16,000	<1-2 months
Insulate equipment and tanks	\$15,000-\$47,000	\$34,000-\$72,000	6-10 months
Recover heat from hot air	\$16,000-\$36,000	\$11,000-\$38,000	7-8 months
Optimize compressed-air system	\$0-\$19,000	\$9,000-\$36,000	<1-12 months

## 5. Financing Energy Efficiency with PFAN-Asia

IEE measures are critical to achieving multiple goals, including reducing energy consumption and emissions that lead to improved productivity, competitiveness, and profitability.

Despite the attractiveness of IEE investments, they have still yet to find widespread adoption in Vietnamese T&G plants due to various factors – most notably the **lack of financial capacity and inadequate ancillary services and support industries** for IEE implementation. This is where PFAN-Asia can help.

PFAN-Asia will support factory owners interested in pursuing IEE investments in an advisory role, providing strategic advisory and mentorship, investment promotion, and tipping point technical assistance as it relates to raising capital.

PFAN-Asia’s support is primarily conducted through highly experienced and qualified Mentors – individuals that possess an extensive track record of successfully raising capital for clean energy companies.

Exhibit 6 How PFAN-Asia works with Project Developers



Exhibit 7 How PFAN-Asia can support IEE investment in Vietnamese T&G Plants

Challenges With IEE Investments	How PFAN-Asia Can Help
<p><b>Access to Finance</b></p> <p>As the majority of Vietnamese T&amp;G plants are small and medium enterprises, they generally do not have sufficient capital or expertise to evaluate and invest in energy efficiency.</p> <p>Meanwhile, many Vietnamese banks do not consider financing IEE initiatives for T&amp;G SMEs as an attractive business. IEE investments can often have complex structures that are difficult to accurately evaluate.</p> <p>From the other side, T&amp;G SMEs are reluctant to borrow from banks, for fear of high interest rates, as well as complex procedures and conditions.</p>	<p><b>Capacity building for both T&amp;G owners and local commercial banks</b></p> <p><b>Strategic Advisory and Mentoring:</b> Highly experienced PFAN-Asia Mentors can assist T&amp;G plants to develop and structure IEE proposals and other related documentation necessary for investor outreach.</p> <p><b>Investment Promotion and Outreach:</b> PFAN-Asia promotes and matches investment ready proposals to suitable investors.</p> <p><b>Capacity building workshops for local financial institutions</b> to develop understanding and approach to evaluate for IEE opportunities.</p>
<p><b>Inadequate ancillary services and support industries</b></p> <p>The availability of local EE equipment and service providers is limited due to the low domestic demand.</p> <p>ESCOs in Vietnam generally small in size and weak in assets. They do not have sufficient financial strength or credibility in providing EE services and products to T&amp;G enterprises.</p>	<p><b>Support strengthening IEE supply chain</b></p> <p><b>Connect local suppliers</b> with multinational manufacturers such as Philips Lighting, Schneider Electric, Honeywell, and Carrier, for knowledge sharing and technology transfer.</p> <p><b>Facilitate interactions</b> between T&amp;G firms and suppliers to gain a better understanding of modern EE technologies and practices.</p> <p><b>Provide advisory and mentorship</b> to local ESCOs that will enable them to scale their operations and grow profitably.</p>

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