



# Dichung

Ride-sharing technology to reduce traffic congestion and CO<sub>2</sub> emissions in urban Viet Nam

**2013 SEED Winner**

**SEED CASE STUDIES: INSIGHTS INTO ENTREPRENEURIAL SOLUTIONS FOR SUSTAINABLE DEVELOPMENT**



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## SEED Case Studies Series

Demonstrating Sustainable Development on the Ground  
Through Locally-driven Eco-entrepreneurship

Social and environmental entrepreneurship, also known as green and inclusive entrepreneurship or eco-entrepreneurship, could play a critical role in achieving a global Green Economy. By embracing the added values of social improvement and wise resource management eco-enterprises that have won a SEED Award are living proof that entrepreneurial partnerships between various stakeholders can create innovative and novel solutions for delivering sustainable development at the grassroots and be economically sustainable.

Over the last ten years, SEED has awarded nearly **180 SEED Awards** to eco-enterprises in 37 countries. While the value of eco-entrepreneurship in delivering sustainable development is increasingly recognised and harnessed in the development sphere, there is still very little data available on the triple bottom line impact of these enterprises and their contribution to sustainable development.

The SEED Case Studies are designed to help fill that gap by generating insights for policy and decision-makers on the role of green and inclusive enterprises in achieving sustainable development, and on enabling factors that can help them overcome barriers and reach scale and replicate.

## AT A GLANCE

Dichung reduces urban traffic congestion, fuel consumption and in turn GHG emissions by providing ride-sharing opportunities for city residents

Dichung's innovative online platform enables businesses and customers to save costs and reduces the impacts of driving

## PRODUCTS &amp; SERVICES



Online customer-to-customer ride-sharing platform



Online business-to-customer marketplace for discounted taxi services and public transport tickets

## KEY FACTS

- Location: Hanoi, Vietnam
- Founded: 2012
- Active: Urban Vietnam
- Employees: 9
- Annual turnover: USD 1,500



## TRIPLE BOTTOM LINE

**Social impacts**

- Reduces traffic congestion and daily travel time
- Stimulates new social bonds and helps to forge trust in urban communities
- Offers cheaper urban transportation services, which have saved 15,000 users over USD 50,000 so far

**Environmental impacts**

- Decreases fuel consumption and air pollution, which is detrimental to human and animal health
- Reduces climate-changing GHG emissions in particular, with more than 143,000 kg of CO<sub>2</sub> savings per year

**Economic impacts**

- Developed modern technologies and payment systems to introduce efficient ride-sharing transactions at the local level
- Helps to build an emerging green transport industry in Vietnam
- Offers cost-effective services to local businesses

## DICHUNG PARTNERSHIP



# 1. Partnering for local solutions

## 1.1 Local Challenges

### Urbanisation in Viet Nam

Viet Nam is a dynamic and economically booming country in South-East Asia. It is a country with a rich tradition of agriculture, especially in rice production, which still employs most of Viet Nam's workforce. The face of Viet Nam is changing quite rapidly however, as the growth of manufacturing and services has outpaced the agricultural sector in the 1990s<sup>1</sup>. Now, the lure of economic prospects in cities such as Hanoi and Ho Chi Minh City drives a growing trend towards urbanisation, and the urban population reached 34% in 2015<sup>2</sup>.

### The congestion crisis

Urbanisation has led to a steady increase in traffic, which is a major cause of pollution in urban areas. 14 million Viet Nameese living in the five major cities<sup>1</sup> need to travel each day and many more millions commute from surrounding areas<sup>2</sup>.

Traditionally, people in Viet Nam were known to be mainly moving around in bicycles. Today, rising incomes have allowed a growing number of people to switch to mopeds and are today boosting interest in cars. "According to econometric studies, every percentage point of economic growth nearly leads to a one-percent increase in households' car ownership and the number of private cars registered in Ho Chi Minh City (HCM City) is growing at an annual rate of 10%"<sup>2</sup>.

<sup>1</sup> Ho Chi Minh City (Saigon) 7.1 million; Hanoi (capital) 3.47 million; Can Tho 1.108 million; Haiphong 1.041 million; Da Nang 926,000

<sup>2</sup> <http://www.dandc.eu/en/article/vietnam-needs-tackle-urban-traffic-congestion>

Passenger numbers in road transport have roughly doubled in Viet Nam between 2007 and 2014<sup>V</sup> and today, the country has more than 43 million motorcycles<sup>VI</sup> and over 1,5 million cars<sup>VII</sup>. According to data collected by the Dichung team, about 70% of drivers travel alone<sup>VIII</sup>. Until the government stopped subsidising local public transport in the late 1980s, there were more buses available and Hanoi even had a tram system while today, only about 10% are using buses<sup>IX</sup>.

On current trends, private cars and public buses are forecast to increase dramatically by 2020, reducing the average speed of motorcycles from 25 km/hr in 2005 down to 8 km/hr, of cars from 27 to 9 km/hr, and of trucks and buses from 16 to 7 km/hr<sup>X</sup> in Hanoi, with a similar situation foreseen for HCM City. Consequently, the government is looking into capping the number of motorcycle permits in Ho Chi Minh City to reduce the congestion<sup>XI</sup>; this would impact drastically on people's mobility, affecting work and other activities.



## Rising air pollution

Congestion causes air pollution, increases greenhouse gas emissions and has a detrimental effect on the health of residents. Air pollution globally has now become the biggest environmental cause of premature death, overtaking poor sanitation and a lack of clean drinking water<sup>XII</sup>. In 2012, Viet Nam was listed in the top ten countries with the worst air pollution in the world<sup>XIII</sup>, making air pollution one of the most significant inhibitors of the country's development and individuals' wellbeing. Congestion itself in urban Viet Nam also negatively affects the economy: the annual expenditures caused by congestion in Ho Chi Minh City and Hanoi alone are calculated to be approximately USD 1.5 billion per year<sup>XIV</sup>.

## 1.2 Creating innovative local solutions

Dichung provides an online e-commerce platform for ride-sharing which allows users to communicate with each other and helps to fill empty seats in vehicles. Ride sharing is a very new concept in Viet Nam, having been on the market for no more than a few years. However, Viet Nam does have high internet penetration with around 45% of the population using the internet and almost 50% of mobile phone users owning a smartphone. E-commerce is a booming sector

that has generated USD 3 billion in revenues in 2014, with almost 60% of internet users buying online that year<sup>XV</sup>, and therefore well lends itself to ride-sharing.

The Dichung enterprise operates at low cost, using open source technologies and maintaining a small and effective team that adapts tested international solutions to the local context. Dichung's online platform offers free customer-to-customer (C2C) services to its community of registered users, with additional services available for a fee such as intermediary payment services where Dichung receives the fees in advance and only pays out to recipients once the service was successfully delivered. Moreover, it also provides business to customer (B2C) services between local transport companies and customers, whereby the transport companies can sell standard tickets directly to customers at reduced prices (20-40 percent discount) because the platform allows them to fill their vehicles and increase cost-efficiency; they can also offer taxi sharing or van-pooling opportunities, which currently is the main offered service as Dichung so far is partnering with 2 major taxi companies. Dichung receives a commission of 1 USD per transaction. Thus, the portfolio of transport options for individual users of the platform include both private ride sharing as well as commercial offers at reduced prices.



### Fast facts

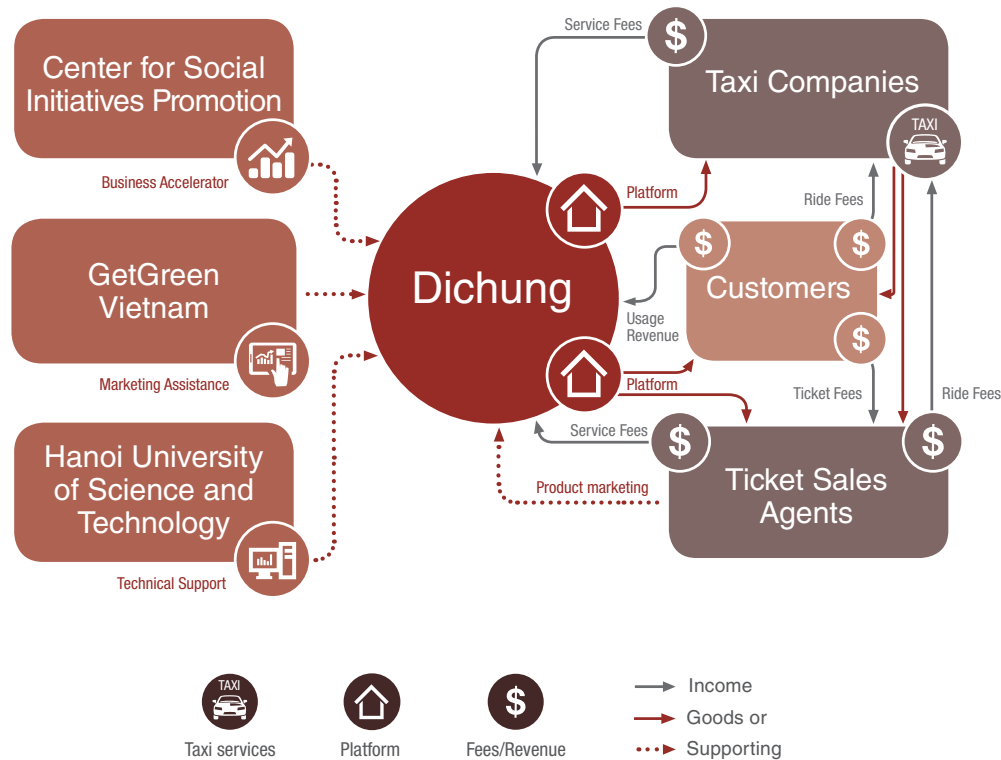
Vietnam is among the top ten countries with the worst air pollution in the world

70% of drivers travel alone and only 10% of the population use public transport

Congestion costs Ho Chi Minh City and Hanoi approximately 1.5 billion USD per year

Vietnam has 45 million personal vehicles with 10% increase in cars every year in HCM City





### Incubator

**The Center for Social Initiatives Promotion (CSIP)** helped Dichung with the initial set-up and subsequently with the further development of the business. Through input and feedback from the CSIP, Dichung was able to develop its innovative business model that builds on collaboration with private sector business partners and includes a B2C marketplace to cross-finance the free private ride-sharing platform.



### National NGO

One partner that helped Dichung with product promotion was a University-based, environmental project called **Getgreen Vietnam**. Since Vietnam has no culture of ride sharing, social messaging and marketing campaigns by Getgreen were particularly important to the business. In turn, by working with Dichung Getgreen is able to deliver against their target of providing sustainable transportation services to local communities.



### Research

Technical support in designing new products and optimising the quality of service came from the **Faculty of Information Technology (FIT) at the Hanoi University of Science and Technology (HUST)**. FIT students tested algorithms for the Dichung online platform and helped push it forward technologically, thereby gaining access to the service as the first client group.



### Business

By working with taxi services such as **Airport Taxi**, serving numerous airports in the country, and **Mai Linh Taxi**, Dichung was able to implement the B2C platform which currently generates the main income stream. Dichung provided these companies with options for sustainable transportation and the opportunity to save costs by filling more seats in their vehicles per ride. Both Airport Taxi and Mai Linh Taxi are large-scale taxi companies that have a great potential to bring revenue to Dichung.

## 1.3 The power of partnerships

### The partnership

Dichung's founders first shared their idea about a local car sharing platform in 2012 with a social business incubator called the Centre for Social Initiatives Promotion (CSIP). Since its conception, Dichung has used a highly successful business approach to developing mutually beneficial partnerships and all of its partnerships have centered around generating revenue and scaling up the business. The enterprise has so far formalised its partnerships through contractual agreements with business partners and through memoranda of understanding with research and NGO partners.

### Partnership management: keeping those that work well

While the business model of Dichung strongly builds on a partnership approach, such relations are dynamic and not without challenges. After initial interest from all sides, Dichung was forced to end the collaboration with two former commercial partners due to technical impracticalities in one case, and unclear commitments in the other case. Dichung learned valuable lessons from

this experience and now enjoys partnerships that are stable and mutually beneficial.

Looking ahead, Dichung has identified areas where new partners could improve the business model further. They are looking to partner, for example, with an entity that could extend their ticket offers beyond taxi services to other modes of transport such as buses and trains. Other potential areas for partnerships would centre on financial support, political advocacy and net-working for green transport systems, all of which would be helpful in scaling-up the enterprise.



Nguyen Nam - Dichung Director

## 2. Building an inclusive eco-enterprise

In early March 2012, the founders of what would become Dichung began sharing their ideas about a ride-sharing programme for Viet Nam. They continued to research ride-sharing programmes around the world and began designing functions and an interface for the programme as a non-profit model. In September of that year, they released a pilot version of the online platform with a customer survey. They also created a business plan with the support of both CSIP and Habataku, a Japanese social incubator. The business grew with their support and was registered as a joint stock company. In 2013, Dichung announced their 3000th membership and as the memberships climbed up to 6000, Dichung designed and tested its business to customer (B2C) programme with their partner Airport Taxi. The enterprise changed its business model from that of a non-profit to a social enterprise. By the end of the year, the B2C service was online and the enterprise had their first revenue stream. They had also won the SEED Low Carbon Award, launched their newer version of the ride sharing programme, and reached their 10,000th member. In early 2015, Dichung reached 15,000 members.

### 2.1 Financial development




Starting from a non-profit model, a revenue stream was only established in late 2013 when they launched the B2C platform. That year, the enterprise received USD14,7000 in grants and generated USD2,500 in sales, but with USD40,000 in costs for marketing, personnel and various other activities, they experienced a loss of USD22,800 which was covered by the team's personal reserves. In 2014, the revenues from sales increased to USD21,000 which were complemented by USD5,000 in grants. Due to the scale-up of activities the costs increased to USD56,000, meaning that the team had to contribute another USD30,000 from their own funds. The future outlook for Dichung is positive however as they have scaled up their model and expect to achieve financial sustainability

in 2016. Based on the popularity of the B2C, sales are expected to grow substantially and the enterprise anticipates a revenue from sales of USD45,000 in 2015, which is the equivalent to 130 transactions a day. They are due to receive a grant of USD50,000 to increase the marketing of the B2C platform and recruit more personnel which will enable the enterprise to increase the number of transactions a day to 300 in 2016, generating an expected USD108,000. Taking into account that 40,000 transactions are processed from and to all airports in Vietnam per day and that the B2C services are already available in almost airports, 300 transaction a day, should be attainable by the end of 2016.

### 2.2 Employment situation

In 2014, Dichung reported 9 direct employees including 3 managers/directors. The highest salary is around USD12,000 with an average of USD6,000 across all full-time positions, in the context of an average per capita income of USD2,000 in 2013<sup>XVI</sup>. Employees also receive health insurance and skills training in areas such as teamwork, time management, task assignment, sales, and online marketing.

#### Fast Employment Facts

Workers	Avg. Salary per Year	Female Workforce
		
9	\$ 6.000	22%
	Full-time employees	Part-time employees
Female	2	0
Male	5	2

### 2.3 Business development

Dichung's limited marketing budget constrained the revenue growth even as the product has been well received by customers and the membership base continues to grow. Dichung has also made strong progress in expanding its market. While they originally aimed to secure one new B2C customer in 2014, the enterprise has actually developed partnerships with five new B2C customer companies. Already now, Dichung's services are conserving 20 out of 21 airports in Viet Nam. Dichung was also relatively successful in building partnerships with ticket sales agents; they are now already working with 50 agents, against a target of 60 sales agents by the end of 2015. These partnerships are expected to strongly

increase the number of B2C transactions on the Dichung platform from the current 70 transactions per day, on average, to 300. This scale-up will allow Dichung to break even and continue to cross-finance the free C2C services. While Dichung's membership numbers have already increased substantially, the biggest obstacles to meeting its growth targets come from the lack of a ride-sharing culture in the country, coupled with issues around technology and method of payment. Dichung has started to study these obstacles further and to analyse the best features of other ridesharing services worldwide so as to adapt them to the local context. Another goal is to further diversify the B2C services offered by including new partners.





### 3. Reaching impact

As a social and environmental enterprise, Dichung works to achieve financial self-sustainability while reducing congestion and its effect on urban citizens and the environment. The enterprise creates economic, social and environmental impact at the same time, for instance by generating financial savings for individuals, by increasing the quality of life in urban centres, and finally by reducing fuel consumption, greenhouse gas emissions, and air pollution.

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“This is a smart, cost-saving and environmentally-friendly service.” – Platform user

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#### 3.1 Beneficiaries

At the start of the value chain, Dichung itself employs a small workforce and provides attractive salaries to its employees. The central beneficiary group is the community of ride-sharers themselves, since the programme saves them money and time. Extending beyond its direct value chain, Dichung's activities help to reduce congestion and therefore benefit the overall population in urban areas, thereby complementing governmental efforts to manage urban transport better.

#### 3.2 Social impact

The Dichung website allows users to overcome technical and communication barriers to sharing vehicles. Ride-sharing offers safe and comfortable travel opportunities in private cars at affordable cost, and the B2C platform provides discounted transport services at reduced prices, thus saving money for low-income residents, especially daily commuters. Users of the B2C platform can save 20-30 percent on taxi fares and transport tickets, and in 2013 and 2014, the savings for platform users amounted to approximately USD 50,000.

Promoting ride-sharing increases quality of life by reducing traffic jams and air pollution that

leads to severe health problems. However, there are also mind-set barriers to making use of ride-sharing opportunities as people are not used to sharing their private vehicles with strangers. The enterprise addresses this by cross-financing its free C2C service with commercial B2C services, so offering an easy and attractive way for people to try out private ride-sharing. The C2C service serves therefore mainly as a way of raising awareness and increasing the openness towards this way of transport. In addition, it strengthens social bonds within the community by connecting people and building social trust in urban Viet Nam.

This social impact can easily be scaled by replicating the B2C services in other cities and airports and by increasing the number of people engaging in C2C. So far over 15,000 people have benefitted from the services.

Finally, Dichung also aims to gradually expand its own workforce and to provide more well-paid jobs.



#### 3.3 Economic impact

The economic aspect of the Triple Bottom Line includes the enterprise's business performance (Section 2) as well as positive effects on the local economy.

Dichung has successfully introduced a new e-commerce service for urban Viet Nam, connecting taxi companies, ticket sales agents, and the urban public via its online platform. Its model represents the modern, high-tech face of the Vietnamese economy by using technology to

enable people to move more efficiently, thereby reducing pressures on the overburdened traffic infrastructure and time lost in traffic jams, which in turn increases productivity for urban citizens. As the Government of Viet Nam is faced with a large and costly infrastructure deficit, Dichung complements the national effort by reducing congestion and increasing the economic prosperity of the country.

Nationwide, congestion leads to a waste of valuable economic resources as large amounts of fuel are consumed by motorbikes and cars idling in traffic every day. In 2015 alone, Dichung will save an estimated 31,000 litres of gasoline, which is roughly equivalent to 430 barrels of crude oil<sup>xvii</sup>. While driving a personal vehicle is traditionally seen as a means of economic freedom in Viet Nam, Dichung is providing an attractive alternative in large urban centres; this could help to change the market culture and shift attitudes of consumers in the future.

The Dichung platform also increases the productivity of transport service providers; by maximising the occupancy rate of available seats in the taxis, the transport services can achieve higher revenues for each trip while reducing their costs per person.

#### 3.4 Environmental impact

Dichung helps to move urban transport into a more sustainable and green direction, as ride-sharing reduces the number of vehicles on the road, resulting in less congestion and traffic jams, which in turn reduces fuel usage and air polluting emissions including greenhouse gases. At its current rate of about 70 B2C transactions per day with an average of 30km each, 143,000 kg CO<sub>2</sub> a year are saved from entering the atmosphere. A total of 14,000 km of privately-shared rides have saved another 2,700 kg CO<sub>2</sub> so far<sup>xviii</sup>. That number increases with each new member that Dichung recruits and every new transaction. Climate change is expected to cost the Vietnamese economy billions of dollars, and hit low lying and agricultural areas particularly hard in the future. A further scale-up and replication of the model could make a significant contribution to reduce the negative effects on vulnerable communities.

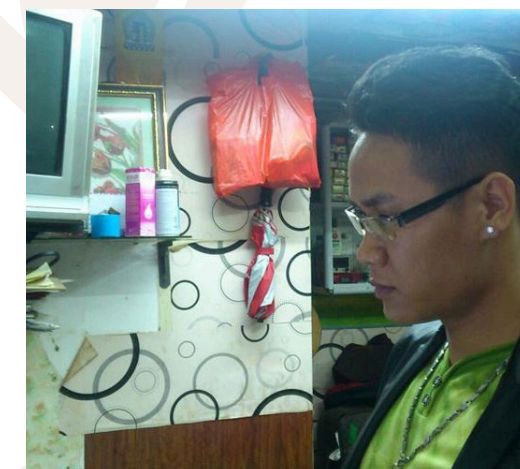
The exhaust emissions of motorised vehicles not only contribute to climate change, but air pollution also causes serious respiratory ailments such as asthma, contribute to cancer and other diseases in the local population<sup>xix</sup>. Saving above-mentioned 31,000 litres of gasoline from being burned in the streets of urban Viet Nam in 2015 alone, Dichung's model is contributing to the reduction of serious air pollution, which brings about interconnected environmental and social (health-related) benefits.

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“The main benefits will be fresher air and better health in the long term.” – Platform user

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Looking ahead, Dichung aims to increase the number of partnerships with organisations that engage in green transport to strengthen each other's efforts and scale-up their environmental impacts.



#### 3.5 Policy impact

In order to encourage and stimulate greener transport, the enterprise has recently been in touch with the Ministry of Transport to seek future government support through financing, raising awareness, and adjustment of infrastructure to cater for ride-sharing.



## 4. Charting green and inclusive growth

### ACHIEVEMENTS

#### Reducing congestion, fuel consumption and air pollution

Dichung has successfully established a ride-sharing platform that now connects a community of over 15,000 active users, recording on average 70 transactions per day on its B2C services alone. Offering a safe and comfortable means of transportation, the enterprise also reduces congestion, fuel consumption, harmful air pollution and GHG emissions, and contributes to increased quality of life in urban Viet Nam. Connecting people through sharing private rides, Dichung facilitates new social networks of trust and cooperation that save resources while building social capital.

### CHALLENGES

#### Mind-set and partnership management

Ride-sharing is a new concept in Viet Nam that requires openness and trust within the user community. While the demand for sharing rides in urban areas could potentially be significant as millions of people are trapped in traffic everyday, alone in their vehicles, the concept is still very foreign to many and there is a lack of trust in sharing rides with strangers. Nevertheless, the numbers of platform users are rising.

Stable partnerships with transportation service providers also proved a challenge at the start, owing to lack of commitment or organisational difficulties. However during 2014 Dichung was able to create more partnerships with transport services than had been originally targeted, suggesting a growing interest both from individuals and from the business sector.

### SUCCESS FACTORS

#### Technology and valuable partnerships

Online services and e-commerce are widely accessible and highly popular in the country, especially within urban target groups. Dichung offers a smart, cost-effective and trustworthy online service to its user community that attracts a growing number of participants. The enterprise has also grown with the support of valuable, complementary partnerships in marketing, product development and business planning, and has managed to secure business partnerships enabling it to enter a promising growth path towards profitability.

### FUTURE NEEDS

#### Partnerships and market development

To further grow its user community, revenues and impacts, Dichung will need to add more diverse business partners to complement its portfolio of transportation options available. It also needs funding to increase awareness raising efforts and change the still-hesitant attitudes of urban communities towards ride-sharing.

As the enterprise works in an area of public interest, government support could lead to synergies and rapid scale up. Such support would be most beneficial in terms of funding, awareness raising or infrastructure such as privileged driving lanes or parking spaces for shared vehicles.



## Acknowledgements

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## About SEED

SEED strengthens the capacity of small grassroots enterprises in developing countries to enhance their social, environmental, and economic benefits, builds bridges between entrepreneurs and policy makers and stimulates exchange and partnership building.

SEED was founded by the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP) and IUCN (International Union for Conservation of Nature) at the 2002 World Summit on Sustainable Development in Johannesburg and is hosted by Adelphi Research gGmbH, based in Berlin, Germany.

Adelphi Research (AR) is a leading think-and-do tank for policy analysis and strategy consulting. The institution offers creative solutions and services regarding global environment and development challenges for policy, business, and civil society communities.

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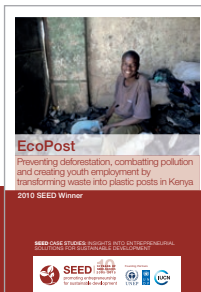
## Notes

This case study is mainly based on interviews and site visits to the enterprise in late 2014 / early 2015, as well as internal documents such as the enterprise's business plan. Additional resources are listed below.

- I Buttinger, Joseph 2015, 'Agriculture, forestry and fishing,' Encyclopaedia of Britannica [www.britannica.com/EBchecked/topic/628349/Vietnam/52704/Agriculture-forestry-and-fishing](http://www.britannica.com/EBchecked/topic/628349/Vietnam/52704/Agriculture-forestry-and-fishing)
- II CIA 2015, The World Fact Book. <https://www.cia.gov/library/publications/the-world-factbook/fields/2219.html>
- III CIA 2015, The World Fact Book.
- IV CIA 2014, The World Fact Book.
- V General Statistics Office 2015, Statistical Handbook of Vietnam 2014, Statistical Publishing House. [www.gso.gov.vn/default\\_en.aspx?tabid=515&idmid=5&ItemID=14278](http://www.gso.gov.vn/default_en.aspx?tabid=515&idmid=5&ItemID=14278)
- VI The Saigon Times, 06.02.2015, Number of registered bikes exceeds 2020 vision. <http://english.thesaigontimes.vn/39463/Number-of-registered-bikes-exceeds-2020-vision.html>
- VII Than Nien News, 07.01.2015, Vietnam hub seeks to limit personal vehicles. <http://www.thanhniennews.com/society/vietnam-hub-seeks-to-limit-personal-vehicles-37267.html>
- VIII The Saigon Times, 06.02.2015.
- IX Bass, Hans-Heinrich; Nguyen, Thanh Trung 2013, Imminent Gridlock. Development and Cooperation, Print Edition no. 4 2013, 2013/04, Page 169 <http://www.dandc.eu/en/article/vietnam-needs-tackle-urban-traffic-congestion>
- X Institute for Transport and Development, University of Applied Science, Bremen 2011, Annual Report 2011/2012. Editors: Bass, Hans-Heinrich and Niemeier, Hans-Martin. [https://www.hs-bremen.de/internet/forschung/einrichtungen/itd/profil/itd\\_annual\\_report\\_final\\_version\\_100dpi.pdf](https://www.hs-bremen.de/internet/forschung/einrichtungen/itd/profil/itd_annual_report_final_version_100dpi.pdf)
- XI The Saigon Times, 27.05.2015, Pilot bike emissions control plan to start in 2017. <http://www.vietnambreakingnews.com/2015/05/pilot-bike-emissions-control-plan-to-start-in-2017/>
- XII OECD 2014, The Cost of Air Pollution: Health Impacts of Road Transport. OECD Publishing. <http://www.oecd.org/env/the-cost-of-air-pollution-9789264210448-en.htm>
- XIII Emerson, John W.; Hsu, Angel; Levy, Marc A.; de Sherbinin, Alex; Mara, Valentina ; Esty, Daniel C; Jaiteh, Malanding 2012, Environmental performance index and pilot trend environmental performance index. New Haven: Yale Center for Environmental Law and Policy. [http://epi.yale.edu/files/2012\\_epi\\_report.pdf](http://epi.yale.edu/files/2012_epi_report.pdf)
- XIV Vietnam.net 17.09.2014, HCM City traffic jams cause an annual \$1.2 billion in damages. <http://english.vietnamnet.vn/fms/society/112091/hcm-city-traffic-jams-cause-an-annual--1-2-billion-in-damages.html>
- XV Moore Corporation 2015, Vietnam Digital Landscape 2015. <http://de.slideshare.net/tinhanhvy/vietnam-digital-landscape-2015>
- XVI The World Bank 2014, Data – GNI per Capita, Atlas Method (current UD\$). <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>
- XVII Based on conversion from U.S. Energy Information Administration, 2014. <http://www.eia.gov/tools/faqs/faq.cfm?id=327&t=9>
- XVIII Based on conversion from National Energy Foundation 2014, Simple Carbon Calculator. <http://www.carbon-calculator.org.uk/>
- XIX OECD 2014



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