

# The environment

**AHEAD OF REGULATIONS:** Major environmental regulations dealing with air pollution, greenhouse gases and invasive marine species will come into effect this decade aiming at reducing the environmental impact of shipping. The Wilh. Wilhelmsen group's ambition is to be at the forefront of environmental regulations, both those already implemented and those expected.

## 0.6%

The fuel consumed per cargo tonnes transported (g/tonne nm) decreased by 0.6% in 2012, showing that our vessels have been operated more efficiently than ever before.



## Petter Chr Jønvik ►

Shipping and environment manager  
Wilh. Wilhelmsen ASA

Petter Chr Jønvik is responsible for setting the strategy for how our vessels shall meet existing and new rules and regulations in the best possible way. For seven years, his main focus has been to find out how we can turn what's good for the environment to be good for business.

"Through our new reporting system, the Performance Monitoring Analysis (PMA), we are able to meet a substantial part of the required reporting from vessel to office. This system, which is installed on all our vessels, also enables us to follow-up on the vessels' performance in a much better way than before. We aim to freight cargo as efficient as possible with less fuel consumption and at the same time minimize our environmental footprint. My contribution to the WW group's success is my effort to keep us in front and prepared for environmental requirements and make sure that our organisation meets future environmental regulations as cost effective as possible," says Petter.







# Why environment matters

The Wilh. Wilhelmsen group is committed to deliver environmentally sustainable solutions to the shipping industry while reducing its own environmental footprint. Sustainability is therefore the guiding principle for our business operations. In this report we present an overview of our most recent environmental initiatives together with the framework in which we operate.

As a leading industrial maritime group we offer a wide portfolio of marine products and services through the world's largest sales and service network. We operate in 40 regular ocean trades and have the capability to provide service in more than 2 200 ports worldwide. Our environmental goal is to continuously reduce emissions from our own vessel operations and supply our shipping customers with marine products that are cost efficient and have minimum impact on the environment. We believe that close cooperation with customers and partners is a key to making this happen.

Our car carrying fleet is one of the most modern in its segment and exemplifies our commitment to staying ahead of environmental regulations. To reduce emissions to air our ships use low sulphur bunkers, and last year we started a pilot project to install the world's largest multi-stream scrubber system on the MV Tarago. We are also exploring solutions to the several challenges of operating in the new Emission Control Areas, both within our

own group, but also with external partners.

On the product side, our joint venture with Yara International, Yarwil, has developed a competitive NO<sub>x</sub> reduction system, while our ship management operation has launched a new green ship recycling service in China. You can read about these and more on the following pages.

## OUR ENVIRONMENTAL FRAME

We believe that accidents and environmental harm can be prevented by maintaining high quality operations and a safety standard based on continuous improvement. Our business units are certified by reputable international certification bodies whenever such certification is required by statute, requested by the market, and/or otherwise found to be positive and desirable. Regular evaluation of the environmental aspects of our business operations is an integrated part of our planning and decision making processes.

We also work with national and international maritime regulatory bodies to promote a practical and effective international statutory regime that creates a level commercial playing field in the industry. Within the constraints of technological development and economic realities, we constantly organise our business to eliminate or minimise problems related to health and the environmental. We believe that harm to the environment is best combated through preventive measures, and will therefore continue to evaluate our environmental risk to find ways to increase level of safety and lower our burden on the environment.



Thomas Wilhelmsen  
Group CEO

# Reducing emissions and launching new initiatives

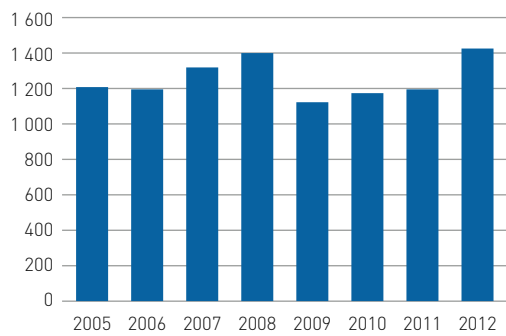
Through ownership in Wilh. Wilhelmsen ASA (WWASA) we take an active part in reducing the environmental footprint of our shipping activities.

Several important environmental achievements were made in 2012. One such example was the creation of Shippersys AB, a joint venture with our partner Wallenius Lines and the weather company StormGeo. The new company's purpose is to develop software solutions that optimize voyages with the help of advanced decision support tools and thereby contribute to more fuel efficient operations. We see opportunities to make this game-changing solution commercially available to the global merchant fleet.

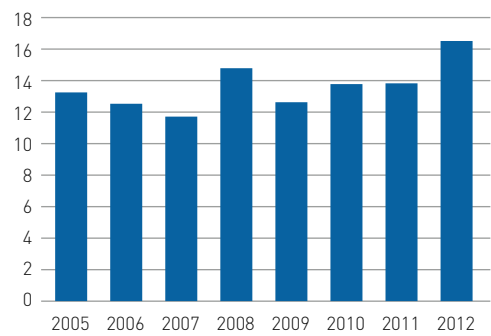
Another initiative was a company-wide Energy Efficiency Competition was conducted in Wallenius Wilhelmsen Logistics for the second year running. Its goal is to reduce fuel consumption, which is a vessel's largest operating cost component. Many good initiatives were submitted, including several that are already implemented through the Ship Energy Efficiency Management Plan (SEEMP) that is onboard all WWASA vessels.

WWASA is also working actively to influence the development of environmental legislation aimed at fair, predictable and practicable rules and regulations for a sustainable shipping industry. Our efforts to limit emissions to air and discharges to sea are based on international regulations such as

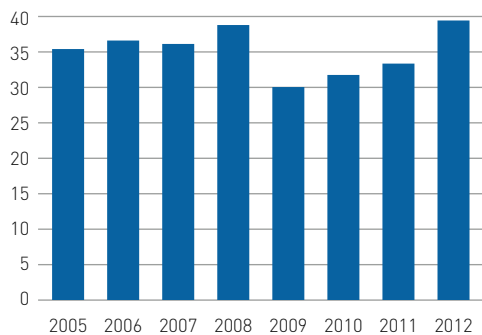
Total CO<sub>2</sub> emissions (THOUSAND TONNES)



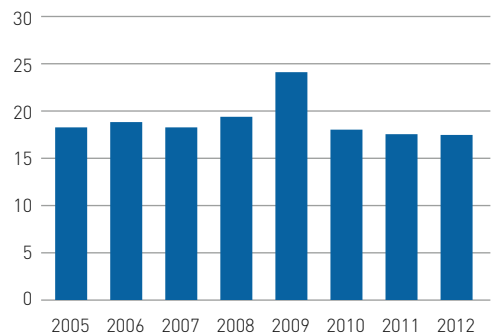
Total SO<sub>x</sub> emissions (THOUSAND TONNES)



Total NO<sub>x</sub> emissions (THOUSAND TONNES)



g fuel/tonne nm





## MV Tysla:

The Mark V vessel MV Tysla was the largest vessel delivered to Wilh. Wilhelmsen ASA in 2012.

IMO's MARPOL 73/78 convention and a number of special national requirements like the Emission Control Areas (ECA) that impose stricter emission limits.

The single largest environmental investment in 2012 was the start of a project to install a 14 metre high multi-stream exhaust gas cleaning system, a so-called scrubber, on the ro-ro vessel MV Tarago. When commissioned, it will be the largest of its type in the world. The scrubber is a pilot unit supplied by Wärtsilä Moss AS and represents a big step towards solutions that can help the industry comply more efficiently with increasingly stringent environmental regulations. It is based on the Krystallon Exhaust Gas Cleaning System (EGCS) that removes sulphur and particulates from the exhaust gases from the vessel's main and auxiliary engines. The system will clean an almost unprecedented amount of exhaust gas: the main engine alone produces around 180 000 kg per hour. When in operation the scrubbing unit will weigh close to 45 tonnes. The installation on the Tarago is scheduled for March 2013 at Sembawang Shipyard in Singapore. The project is headed by WWASA's technical department.

Emissions generated by our vessels are monitored on a continual basis. This account covers

the 35 vessels owned and controlled by WWASA and operated by Wallenius Wilhelmsen Logistics and EUKOR Car Carriers.

Despite a new record in shipping volumes in 2012, the fuel consumed per cargo tonne over distance (g/tonne nm) decreased by 0.6%, showing that our vessels have been operated more efficiently than ever before.

Total SO<sub>x</sub> and NO<sub>x</sub> emissions were slightly higher in 2012 than in 2011 due to increased number of vessels in the fleet but emissions per transported unit decreased. Average sulphur content in fuel consumed on board our vessels in 2012 was 1.8%, which is far below the legislative limit of 3.5% set by the International Maritime Organisation (IMO).

During 2012 the group took delivery of three new vessels for WWASA's own account: MV Tysla, MV Tulane, and MV Tongala. No vessels were recycled in 2012.

For more information and further details regarding the various environmental initiatives in Wilh. Wilhelmsen ASA, please see the WWASA Annual Report 2012 and the section Environment in particular.



# Staying at the forefront of regulations

Major environmental regulation dealing with air pollution, greenhouse gases and invasive marine species will come into effect this decade that is aimed at reducing the environmental impact of shipping. Their scope will include international, regional, country and state level regulations. Our ambition is to be at the forefront of environmental regulations, both those already implemented and those expected. This illustration gives an overview of some upcoming major maritime environmental regulations and how WWASA is prepared.

## REGULATIONS IN THE PIPELINE

### Global Greenhouse Gas regulations and regulatory price of CO<sub>2</sub>

In January 2013, all vessels are required by the International Maritime Organisation (IMO) to have a vessel specific Ship Energy Efficiency Management Plan (SEEMP) onboard. This plan is intended to be used for continuous improvement of energy efficiency measures. Also in 2013, IMO has implemented the Energy Efficiency Design Index (EEDI), ensuring more energy efficient vessels being built, i.e. it only applies to new builds. IMO has also been discussing a market-based mechanism for CO<sub>2</sub> emissions from shipping. Concurrently, the EU is developing a proposal to include maritime transport emissions in the EU's green house gas (GHG) reduction commitments. It is also anticipated that the EU will adopt a MRV (measurement, reporting and verification) requirement in the short-medium term to help better quantify the scale and distribution of GHG emissions from the European fleet.

**WWASA's position:** *Reducing fuel consumed per unit transported by WASA's owned vessels is the most efficient contribution to reduce CO<sub>2</sub> emissions, and the company works to influence IMO to form new regulations aiming at obtaining a level playing field for the shipping industry. The SEEMP, now onboard all our vessels, will be the key to implement and follow-up of initiatives to obtain more energy efficient operations.*

### Ballast Water Management Convention

When ratified, the convention will require vessels to install ballast water treatment systems from 1 January, 2016. As of 2012, the 30 required Member States and 26% of the required 35% of world tonnage have ratified the convention.

**WWASA's position:** *We endorse ballast water treatment, and several of our vessels are equipped with pilot installations to find the most suitable and reliable system for retrofit.*

### THE HONG KONG CONVENTION

The 2009 Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, aims at ensuring that ships, when being recycled, do not pose any unnecessary risks to human health, safety and to the environment. The convention is yet to be ratified by the necessary 15 States, representing 40 per cent of world merchant shipping by gross tonnage.

**WWASA's position:** *Our policy is that all vessels should be recycled in accordance with The Hong Kong Convention. We have approved recycling yards in China. All our vessels are issued with Inventory of Hazardous Materials / Green Passport certified by Class, before recycling.*

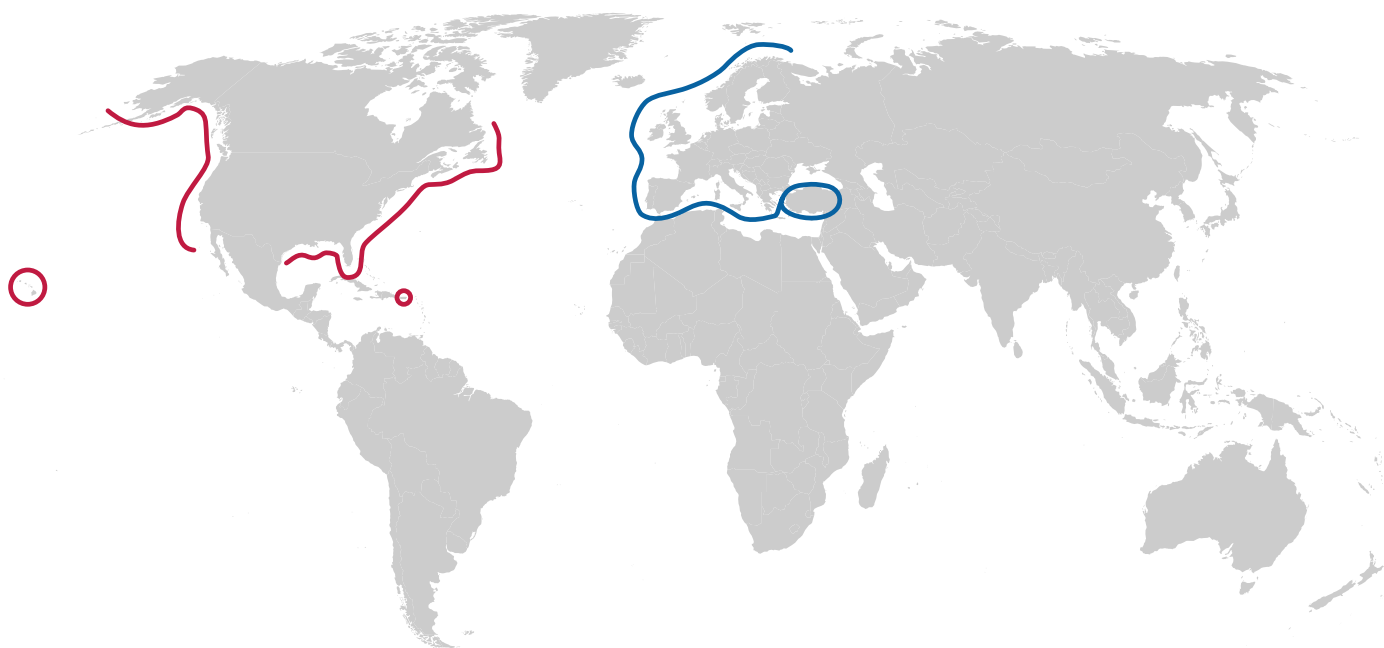
### EMISSION CONTROL AREAS (ECA)

The International Convention for the Prevention of Pollution from Ships (MARPOL) defines certain sea areas as "special areas" in which, for reasons related to their oceanography, ecological conditions and sea traffic volume, require special controls for the prevention of sea pollution. Under the Convention these ECAs ('Emission Control Areas') are provided with a higher level of protection than other areas of the sea. Today there are several such ECAs in operation in both Europe, the US and the Caribbean, covering both SO<sub>x</sub> and NO<sub>x</sub> emissions. The major ECAs include:

#### Designated Emission Control Areas (date of entry into force):

2006-05-19: Baltic Sea  
2007-11-22: North Sea  
2012-08-01: US and Canada  
2014-01-01: Caribbean

**Emission Control Areas (ECAs):** The International Convention for the Prevention of Pollution from Ships (MARPOL) defines certain sea areas as "special areas" in which, for reasons related to their oceanography, ecological conditions and sea traffic volume, require special controls for the prevention of sea pollution. Ships operating in the ECA zones will have to burn much cleaner fuel or use abatement systems, to comply with stricter emissions of sulphur, NO<sub>x</sub> and other greenhouse gases. Today, most ECAs are located in Europe, the United States and Canada.



#### ECA Sulphur Limits

2010-07-01: Max 1.00%  
2015-01-01: Max 0.10%

#### ECA NO<sub>x</sub> Limits

2011-01-01: Tier II  
2016-01-01: Tier III

In addition to the above ECAs under MARPOL, there are also other environmental regulations that apply:

#### EU Sulphur Directive

2010-01-01: Max 0.1% at berth

#### Turkey Sulphur Regulation

2012-01-01: Max 0.1% at berth

#### Global Sulphur Limits

2012-01-01: Max 3.50%  
2020-01-01\*: Max 0.50%

\* subject to feasibility review in 2018

#### California Air Resources Board Sulphur in fuel limits (24nm from coast)

2009-07-01: Max 1.5% MGO , or 0.5% MDO  
2012-08-01: Max 1.0% MGO or 0.5% MDO  
2014-01-01: Max 0.1% MGO /MDO

**WWASA's position:** *Through WWL's low sulphur policy, we have gained vast experience with low sulphur operations. To meet the requirement of future ECAs, we are working closely within the group and with industry partners to find the most cost-efficient and environmentally sound solution. Currently there is no single solution to the sulphur challenge, and the group is engaged in a four stream approach exploring different options. One initiative is the installation and testing of a Exhaust Gas Cleaning System (EGCS) onboard one of our vessels in 2013.*



WILHELMSSEN MARITIME SERVICES:

# Going green makes sense

Through our maritime services segment, the Wilh. Wilhelmsen group has a unique position to contribute to making the industry green, through offering environmentally sound products and solutions to the whole merchant fleet. The company's key advantage is its unparalleled global network with the capability to serve customers in more than 2 200 ports in 125 countries.

Shipping is the cleanest form of transport. While much progress has been made to reduce its impact on the environment, there is still a lot of potential for further improvement. Wilhelmsen Maritime Services believe that environmental thinking makes good business sense and that by working together with our customers we can make a difference.

To have meaning, environmental focus has to be permanent – like a state of mind. Sustainability is therefore a principle for all our business operations. Our commitment is derived from this: deliver environmentally sustainable solutions to world shipping and contribute to reducing the overall environmental footprint of our industry. This commitment is right up there on our list of priorities together with financial objectives and corporate social responsibility.

## ENABLING A GREENER FUTURE

The less energy a ship consumes the less fuel it will burn and the less it will pollute the environment. It will also cost less to operate. Our technical solutions team has so far commissioned energy management systems on 40 vessels with an accumulated energy savings of 75 MWh (million kilowatt-hours), equivalent to 35 000 tonnes fuel oil annually resulting in an emissions reduction of 112 000 tonnes of CO<sub>2</sub> per year. It's all about controlling engine room ventilation based on actual demand to get optimum operation. Versions for engine room ventilation on merchant vessels as well as for cargo hold ventilation on ro-ro vessels will be launched in 2013.

An efficient method of reducing local air pollution while the vessel is in port is to use so called "cold Ironing", i.e. a solution where the ship closes down its diesel generators and instead hooks up to the shore based power grid. "Cold Ironing" is increasingly accepted in the maritime industry,

and our technical solutions team has in 2012 installed such systems on a number of container vessels.

Nitrogen oxides are toxic gases, harmful to human health, causing asthma and other respiratory diseases. It is a big problem in many coastal areas. In 2012, Yarwil, our joint venture with Yara, enough of our NOxCare product around the world to remove NO<sub>x</sub> emissions by far more than the Norwegian NO<sub>x</sub> fund's total target for 2012.

Traditional ship recycling has been the subject of much concern worldwide. Our ship management team's new Green Ship Recycling service made an important breakthrough when it was audited by Det Norske Veritas (DNV) under their standards for sustainable business. It means that the recycling shipyard can meet DNV's standards and international requirements for the safe and environmentally sound recycling of ships. In 2012, our ship management team entered into an agreement with ClassNK Consulting Service, Japan, to form a consulting service to provide ship owners with the Ship Recycling Facility Plan services, a document which recycling facilities must establish comply with the Hong Kong Convention. The objective of the partnership is to introduce safe and environmentally sound ship recycling facilities. The first Statement of Compliance (SOC) in the world was issued by ClassNK to Jiangmen Zhongxin Shipbreaking & Steel Co.) in China in 2012.

Our ship management branch has also entered into another agreement with ClassNK to develop "Inventory of Hazardous Materials" list (IHM) for ship owners. The list will be used as a basis for preparing the Ship Recycling Plan, which the recycling yard or facility must develop and have certified prior to recycling a vessel. Under the Hong Kong Convention, an updated Inventory of Hazardous Material will be mandatory for vessel operation and prior to recycling.

Ships use large amounts of chemicals for cleaning, maintenance, water treatment and fuel treatment. Our ships services team leads the industry in innovating environmentally acceptable marine chemicals. One such example is Gamazyme, a successful range of bioactive chemical products.



## Yarwil:

Yarwil, our joint-venture with Yara International, has developed NOxCare, a competitive solution for removing NOx. With this system, more than 95% of the nitrogen oxide emissions from a vessel's exhaust is removed. By using a catalyst and adding urea and water, dangerous NOx emissions are transformed into harmless nitrogen and water.

Gamazyme products are used to clean galley, accommodation and bathroom areas and to treat grey and black water systems in a natural and environmentally safe way. New and improved formulations act even faster and more effectively to provide a quicker solution to well-known problems such as bad odours, blocked pipes and unhygienic conditions for both crew members and passengers. There are now also Gamazyme products that reduce the formation of toxic hydrogen sulphide (H<sub>2</sub>S) gases in food waste systems that improve safety onboard. The Gamazyme range is under constant development and we expect to see further developments in 2013 and the years to come. All chemical production takes place at our own factory near Tønsberg, Norway. The facility is highly automated and can produce 100 million litres per year. Production is certified under both ISO 9001 and ISO 14001.

Our commitment to the environment has also resulted in products like tin free solder, TIG welding electrodes without the radioactive element Thorium, as well as an extensive programme to phase out the HCFC gas R-22 and replace it with environmentally acceptable gases like HFC R-417A.

### INNOVATIVE SOLUTIONS FOR THE MARITIME INDUSTRY

During 2012, we initiated several environmental actions, including several in collaboration with external partners. We hold a board position in the Norwegian Forum for Environmental Technology, which organises leading Norwegian companies from the energy, maritime and power consuming sectors in Norway. Trade unions are also represented. The vision is to develop a cluster for environmental technology oriented

companies that can create the basis for a global environmental industry.

#### Regulatory initiatives

Wilhelmsen Maritime Services is an active contributor to the various IMO committees and sub-committees in collaboration with the Norwegian Maritime Authority and other nations' delegations. Our role is to bring our view as ship operators/ship service providers to the process of developing IMO maritime legislation. We believe this contribution will improve the environmental footprint and future of international ship operation.

#### Large business potential

WMS' combination of engineering and global network capabilities makes it possible to develop and deliver environmental solutions for our customers. This business has large potential to yield a good return on investment to the shareholders. This will be achieved by offering the best available technologies in the market; helping our custom-

ers to stay environmentally compliant and contributing to reduce their vessel operating costs.

We have stumbled a couple of times along the way, for example the withdrawal of the Unitor Ballast Water Treatment System from the market in April 2012 due to operational deficiencies. We were concerned that the system would not deliver the needed effects to our customers. It was a tough but necessary decision that taught us a lot about major technology projects. Our commitment to developing green solutions remains solid, however.

Our green commitment is a good fit with our vision of shaping the maritime industry. Being the shaper means to take into account customer demands, international regulations and future technology. Through profitability and innovation we are committed to address the environmental challenges of the maritime industry. Going green makes a lot of sense to Wilhelmsen Maritime Services and the Wilh. Wilhelmsen group.

## During 2012 we initiated or participated in three larger development projects:

#### Scrubber for removal of sulphur and soot

Wilhelmsen Maritime Services is involved in a joint project with the Norwegian company Maritime Protection in Kristiansand to develop a scrubber that will remove sulphur and soot from main and auxiliary engines. Extensive tests for a land-based test installation are well underway, with positive results. A full-scale test installation on a vessel is planned for 2014. The project objective is to offer a commercially tested version of the scrubber in 2015 when new legislation on sulphur limits is expected to create a significant demand for scrubbers.

#### Catalyst for removal of NOx

Yarwil, WMS joint-venture with Yara International, has developed a competitive solution for removing NOx called NOxCare. With this system, more than 95% of the nitrogen oxide emissions from a vessel's exhaust are

removed. By using a catalyst and adding urea and water, dangerous NOx emissions are transformed into harmless nitrogen and water. More than 150 systems have been delivered to vessels so far. Yarwil is currently developing a version that can also work in large two-stroke marine engines.

#### Bunker tanks for storage of LNG

Together with prominent technological companies like DNV, Marintek, Liquiline and NLI, WMS and its affiliated companies TI Marine Contracting and Wilhelmsen Marine Consultants is working to develop new, competitive bunker tanks for storing liquefied natural gas (LNG). The tanks are made of stainless steel and operate at low pressure, making them well suited for floating storage, production and transport. Tank insulation is provided by TI Marine Contracting.



## Daisy Wanderley ►

Customer service manager Latin America  
Wilhelmsen Ships Service

**In 2006, Daisy Wanderley had a key role in establishing the customer service centre in Rio de Janeiro. Now she is in charge of customer service for the entire Latin America.**

"A customer service manager is responsible for satisfying the customers' needs and to be proactive on their demands. I have a team of 15 people located in Latin America which is the point of contact for our customers on a daily basis. When working in customer service, you are expected to know everything about the products. My contribution to the WW group's success is to constantly focus on training and increasing my team's knowledge to make sure we are meeting the customers' needs," says Daisy.

