



4FOLD Reduction of the International Transport of Empty Containers by Folding

Reporting

Project Information

4FOLD Phase 2

Grant agreement ID: 711257

[Project website](#) 

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Project closed

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€ 2 466 636,00

Coordinated by

HOLLAND CONTAINER
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 Netherlands

Periodic Reporting for period 4 - 4FOLD Phase 2 (4FOLD Reduction of the International Transport of Empty Containers by Folding)

Reporting period: 2018-05-01 to 2019-03-31

[Summary of the context and overall objectives of the project](#)



In 2016 the European Union decided to include HCI in the Horizon 2020 Research and Innovation Program (Agreement 711257) because of the environmental aspect of the 4FOLD: Foldable containers reduce empty transport. With this endorsement of 2.5 Million Euros from the European Union, HCI now has a production line in China that allows production of 4FOLD containers on a large scale at lower costs and an acceptable lead time.

Due to the global imbalance of import/export ca. €25 billion a year is spent on repositioning empty containers and unnecessary emissions of CO₂, NO_x and PM are generated. The technical solution proposed by HCI is the 4FOLD foldable container. 4 folded 4FOLD containers stacked have the same dimensions as 1 container, enabling the reduction of transport movements up to 75%. An increase of the shipping lines' profit margin of 600% is possible, corresponding to savings up to 25% on the operational costs and 27% on the total CO₂ emissions of container transport at sea.

A reduction of 25% on operational costs can be achieved, giving an huge economic boost to the EU logistics sector and the total EU economy. The 4FOLD strengthens the EU transport sector by making container transport more time and cost efficient, creating new jobs and tackling the mentioned environmental and mobility defies.

The overall goal of the Phase2 project is to catalyze market uptake of the 4FOLD foldable container. A large scale demonstration is necessary to convince the conservative logistics sector of the added value and usability of the 4FOLD and opens the market for this innovation. In this objective, feasibility, cost price, lead-time, durability and scale is very important in order to be successful.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

To kick-off the EU project, HCI gave several demonstrations at different places in Europe to showcase 4FOLD to a wider audience. HCI demonstrations were held in Radicatel, France; Rotterdam, the Netherlands; Hamburg and Mainz, Germany; Wolfurt, Austria; Istanbul, Turkey; and Haifa, Israel. Furthermore, HCI sent a bundle from Venlo, the Netherlands by train to Busto, Italy as a showcase the use of 4FOLD by train. HCI also participated in the Intermodal in Rotterdam, the largest container exhibition in the world. At HCI's booth, HCI spoke with many new and current prospects. Several parties tested and used 4FOLD in this project. To support the usage of the 4FOLD containers and folding demonstrations, HCI also created live documents in the form of manuals, on how to operate the container, as well as how to maintain and repair the containers. HCI also created a spare parts list.

Furthermore, HCI has developed and started implementing an international training program to certify several depots worldwide to become a 'certified 4FOLD depot'. This means certification means after the depot has completed training from HCI, can independently (un)fold, operate, maintain 4FOLDS. More than 50 depots have been officially certified in the world, and are able to fold or unfold the 4FOLD without any issues within 10 minutes.

Several containers have been produced during the EU project. HCI was able to further improve the production process with the factory, as well as updates to the container design where necessary.

The first batches of containers have been used in the various demonstration project to and from

Europe. HCI created an updated marketing and communication strategy, which are both being implemented at this time. One of the focus points of the marketing strategy is the use of sales agents in locations where HCI has little or no presence. At this time HCI has about 5 agents in different parts of the world and this number is growing. On the manufacturing side HCI has implemented further updates to bring the labour costs down for the building of containers, one of the key objectives of the project. This is done through design updates as well as the increased use of jigs and moulds in the factory.

The second and third trial runs are generally positive and the trials have concluded more successful round trips. The HCI container will be used in a global market and the end users are mainly large and reputable shipping companies. These end users (and the container lease companies) will try to avoid (a temporary) confiscation of a (leased) container because of patent or copy right infringement. HCI will keep a register of all unique container numbers (BIC codes) built under a HCI license. A new patent was filed in September 2018. This patent further enhances the IP protection of the 4FOLD foldable container in key countries around the world and is important for the 'one road, one belt' initiative, the rail connection between China and Europe. HCI is still working on a number of certifications for the railways, specifically for China and Russia. These are long running procedures, but HCI is confident that these certifications should be finalized soon. Part of these certifications will be necessary to make it possible to use 4FOLD on the new "Silk route" to Europe from China. This route is expected to show a strong growth in volume. HCI regularly attends trade shows where the results of the project are shown and new leads are generated based on these results.

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

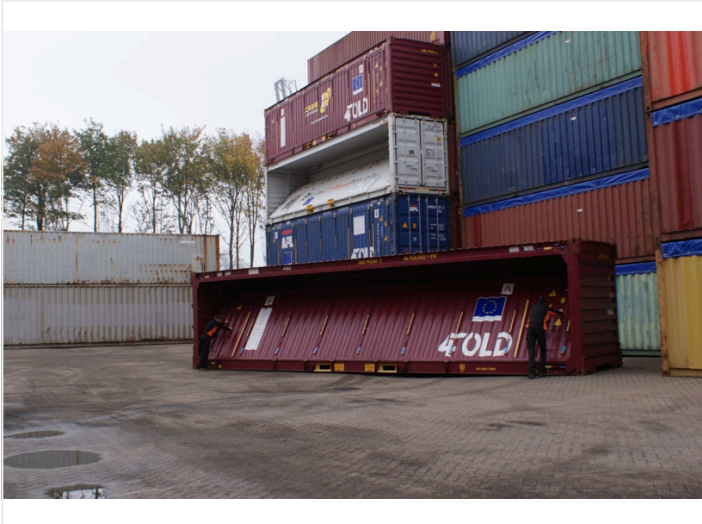
Ever since this project was granted, HCI has increased the number of postings with the appropriate reference to H2020 project to keep all stakeholders up-to-date. HCI has received attention in a variety of media from professional magazines to environmental competitions. Next to that HCI went to several EU organized corporate events, like P&G and Electrolux.

The batch containers has been ISO certified (a standard container certification) by two agencies, Lloyds Register and the Chinese Classification Society (CCS). 4FOLD has already received clearance from Chinese Customs authorities for railway transport, opening opportunities for the usage of 4FOLD on rail to Europe following the Silk Route.

Extending the EU subsidy created the opportunity to lower the cost price for the next batch, which, in turn, will result in huge savings. HCI has devised a clear plan for the near future on how to reduce the cost price while increasing the order volume. HCI has finished a final improved design that will ease production and lower material cost, and as a result the cost price for this batch will drop further.

Since the market is growing, the total TEU capacity increased by 20% in the last four years. The top 10 shipping lines in 2017 have the same market share as the top 20 in 2013, almost 87% of the total market share. These figures reflect a shift in the competitive landscape in 2013 when 10 out of the 20 shipping lines either merged or went bankrupt, including two of HCI's biggest clients, APL and HANJIN.

HCI has been gathering data from market parties to form a comprehensive marketing strategy for the EU market launch. A point of interest here is that HCI not only focuses on the large shipping lines, but also explicitly has started to target smaller companies that sometimes operate in challenging environments with high imbalances. HCI has also developed together with CE Delft a CO2 Tool. This tool predicts the CO2 savings which will be made when using a 4FOLD on a certain route. The use of 4FOLD will generate CO2 savings on all empty repositioning where the container is used, it will also lower the pressure on infrastructure around ports due to fewer transport movements needed to ship the same number of containers.



Demonstration of 4FOLD in Rotterdam



4FOLD unfolding training at Frankenbach
Germany



4FOLD containers on the train in Milan, Italy



Training at the Eimskip depot



Demonstration of 4FOLD in Hamburg



Delivery of containers to Sinotrans for the demonstraion project

Last update: 19 November 2019

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European Union, 2025