

### The environmental case for inventory optimization

On 7 October 2018, the Intergovernmental Panel on Climate Change (IPCC) published a special report on the impact of a 1.5°C increase in global temperatures.<sup>1</sup> It makes for sobering reading, but it also sets out 5 concrete steps that we can collectively take to limit global warming to 1.5°C:

1. A decline in CO2 emissions of 45% from 2010 levels by 2030
2. Renewables to provide up to 85% of global electricity by 2050
3. Coal burning to be all but eliminated
4. 7m square kilometres of land to be used for energy crops
5. Global net zero emissions by 2050

This magnitude of challenge can seem overwhelming, and some of these steps seem out of our direct control. But we as individuals and we as businesses not only can but must contribute to global efforts if we are to succeed. The way we travel and consume, the way we produce and how we manage waste will all contribute to success. There is no quick and simple fix here, we relentlessly need to explore all avenues.

The role of inventory management in improving environmental outcomes was recently highlighted in Britain when fashion brand Burberry received unwanted publicity for destroying unsold stock, some of it being burnt. To be fair to Burberry, they say the energy from burning stock was captured, they have since announced a halt to disposing of obsolete stock in this way, and they are merely confronted with exactly the same challenge that almost all businesses face: finding the best balance between maximising sales and reducing waste.

None of us knows exactly how much demand there will be for any product. If we don't have enough to meet customer demand, sales and sometimes even customers are lost. If we have too much, we are confronted with waste. Perishability adds to the complication, whether actual (eg foods or medicines) or virtual (eg fashion goods or newspapers – they don't literally perish, but their usefulness drastically diminishes past a certain point in time). Companies can calculate the sweet spot using a form of the so-called newsvendor model,<sup>2</sup> which in its simplest form works out statistically how much to stock in order to maximise profit.

Governments can influence environmental impacts by encouraging companies to generate less waste through environmental taxes and regulations. But even without such external impetus, our experience at nVentic suggests that almost all organizations have a strong purely commercial business case to improve their inventory management and thereby reduce their environmental footprint.

For every item produced that is not sold there are a series of wastes: wasted raw materials, wasted energy used for extraction and conversion, wasted storage, wasted transport and wasted disposal. Happily, this is an instance where commercial self-interest is aligned with environmental stewardship – reducing all of these wastes saves money! Inventory optimization reduces waste while protecting sales – you strive to get as close to what you actually need as possible, normally erring on the side of having a little too much.

Of course, even with the best inventory management in the world there will still be waste. You can't totally eradicate waste from the apparel supply chain unless you start telling people what to wear. For essential medicines to be immediately available in hospitals a very high proportion of the time,

buffer stocks are a necessity. Given their perishability, there will be some waste most of the time. The higher availability you need to guarantee for your products, the more waste there will be.

But the impossibility of perfection should not discourage us from targeting improvement. We come back to our contention that most organizations can do significantly better than they do today. We can't completely eradicate waste, but we can certainly reduce it, and inventory optimization balances waste reduction with delivering great service to consumers.

So why have more organizations not optimized their inventories? Management consulting companies like REL and PWC produce regular reports on working capital<sup>3</sup> and these reports depressingly show very little progress in inventory reduction at a macro level over the last 5 years, even if individual companies can and do make major progress, and even if the potential commercial benefits are huge.

The challenge, in a word, is difficulty. Inventory optimization requires sophisticated use of statistics and a concerted organizational focus on it as an objective. Many organizations have tried and failed to get inventory under control; or maybe they have succeeded in delivering a reduction in the short term only to see levels creep back up again.

But just because something is difficult, it does not mean we should set it aside. Limiting global warming to 1.5°C is going to require a number of difficult things to be done.

This is a call to action. Add inventory optimization to your priorities list. Your shareholders will thank you for it. But so will your grandchildren.

nVentic is a business consulting firm specializing in inventory optimization, not an environmental or non-profit organization. If you would like to talk to us about how to improve your inventory management, please contact us: [information@nventic.com](mailto:information@nventic.com)

#### Notes:

1. For the full report, see <http://ipcc.ch/report/sr15/>
2. For the newsvendor model, see [https://en.wikipedia.org/wiki/Newsvendor\\_model](https://en.wikipedia.org/wiki/Newsvendor_model). In this model, the cost to the environment can easily be factored in though it is not so easy to quantify. See "Design for the Environment: Life-Cycle Approach Using a Newsvendor Model", Gal Ray, Cheryl T. Druehl & Vered Blass, *Production and Operations Management Society*, Volume 22, Issue 4, July-August 2013, pp. 940-957. See also "Models for Operation Management under Carbon Policies – A Review", Liya Su, Bin Xiao, Chenxia Suo & Yong Yang, *Chemical Engineering Transactions*, Volume 51, 2016, pp.1159-1164
3. See <https://www.thehackettgroup.com/eu-working-capital-survey-1807/>, <https://www.thehackettgroup.com/us-working-capital-survey-1807/>, <https://www.pwc.com/gx/en/services/advisory/deals/business-recovery-restructuring/working-capital-opportunity.html>