

# Boost to Reduce!

Upgrade GT filtration to slash CO<sub>2</sub> emissions  
per MWh produced



Clean air solutions for turbomachinery

# CUTTING YOUR TAX ON CARBON

We understand the pressure you are under to cut your organization's carbon footprint – and the corresponding taxes! New carbon taxes and stricter regulations just intensify this pressure. But as you explore all your options to go green, you may be overlooking the easiest, most cost-effective way to dramatically reduce CO<sub>2</sub> emissions across your entire operation...

## **UPGRADE THE INTAKE FILTERS ON YOUR GAS TURBINES.**

When you use more efficient air intake filters that are adapted to your environmental and operational conditions, you get cleaner-running engines with less fouling, corrosion and reduced air resistance across the system. The engines don't have to work

as hard, so they use less fuel. Burning less fuel for the same output means less CO<sub>2</sub> produced, stopping CO<sub>2</sub> before it's even released. Depending on your environment, operations, and current solution –

***you could slash your total CO<sub>2</sub> emissions by more than 5% per year, per megawatt hour produced.***

Upgrading from a standard filtration solution to an optimized high-efficiency EPA solution may cut your CO<sub>2</sub> output by thousands of tonnes per turbine each year. Multiply that saving across your entire fleet to see the true impact of this painless, common-sense retrofit.



## **ADDITIONAL PERFORMANCE BENEFITS AND INCREASED PROFITS**

- Increase profitability from fuel efficiency
- Increase availability for production
- Extend GT part life
- Extend filter life
- Increase reliability
- Increase safety

So when it comes to slashing your carbon footprint, remember these three words...  
**BOOST TO REDUCE!**

It's the best idea you've never thought of to drastically reduce your CO<sub>2</sub> emissions.

# HOW IT WORKS

**Fouling, corrosion, and pressure drop cause gas turbines to become less efficient, limiting their maximum power output and increasing their heat rate. Engines with higher heat rates must burn more fuel to produce the same power.**

## BASE LOAD APPLICATIONS

Base load applications generally operate at maximum capacity. As a fouled engine will have a limited power output, you may need to operate more turbine engines to make up the lost power output. Carbon emissions and CO<sub>2</sub> intensity<sup>1</sup> increase because more fuel is being burnt.

## PART LOAD APPLICATIONS


Part load applications generally do not operate at maximum capacity. However, to maintain the same power output with a fouled engine, since heat rate has increased, fuel consumption, and therefore the total CO<sub>2</sub> emissions and CO<sub>2</sub> intensity, increase.

**Higher rated hydrophobic filters with a low and stable pressure drop (dP) better protect gas turbines under all weather conditions, which reduces fouling and corrosion. The engines run more efficiently, which cuts CO<sub>2</sub> intensity, and as such overall emissions.**

<sup>1</sup>CO<sub>2</sub> intensity is the ratio of the amount of CO<sub>2</sub> generated per unit of energy.

# CARBON SAVINGS WITH AIR INLET FILTERS

Replacing standard intake filters with more efficient filters has proven to reduce emissions.

In the case highlighted below, upgrading from a standard M6 filter to an E12 hydrophobic filter could **save you up to 35 000 tonnes in CO<sub>2</sub> emissions, per year, or a 5% reduction from your total emissions per megawatt hour produced. This is equivalent to removing 18 000  from the road!**

**Table: A comparison of the carbon savings achieved with different filter combinations**

Air inlet filters		Impact on heat rate	Emissions related to filtration	Yearly conclusions		
Pre-filter	Final filter	Heat rate reduction vs. baseline (kJ/kWh)	Tonnes of CO <sub>2</sub> per year	Tonnes CO <sub>2</sub> savings vs baseline	Total CO <sub>2</sub> reduction vs. baseline (%)	Equivalent cars removed from the road
Bag filter G4	Bag filter M6	0	38 000			
30/30 GT G4	Composite F8	180	24 000	14 000	2.0%	8 000
30/30 GT G4	Composite F9	270	17 000	21 000	3.0%	12 000
Cam-Flo Hybrid F7	CamGT 3V-600 E10	395	7 000	31 000	4.5%	17 000
CamGT 3V-600 F8	CamGT 3V-600 E12	440	3 000	35 000	5.0%	18 000

Assuming part load application; Heat rate: 8 600kJ/kWh; Operating hours: 8 000; Power output: 200 MW  
Assuming the average car travels roughly 20 000 km a year, following European Environment Agency 2020 vehicular carbon emissions target of 95g CO<sub>2</sub>/km

Visit [BoostToReduce.com](https://www.boosttoreduce.com) and calculate your potential savings!

**CO<sub>2</sub> EMISSIONS  
CALCULATOR**

**CO<sub>2</sub> TAX  
CALCULATOR**

Contact us: [BoostToReduce@camfil.com](mailto:BoostToReduce@camfil.com)

# THE SMARTEST WAY TO REDUCE CO<sub>2</sub> EMISSIONS

There are many methods of cutting CO<sub>2</sub> intensity such as carbon scrubbing, post-combustion carbon capture and pre-combustion carbon capture. However, all of these methods require additional infrastructure to be built, leading to higher maintenance and operational costs. Another option is to upgrade the gas turbine to a more efficient version, but this requires a very high capital expenditure.

What has a lower cost?  
Modernizing your fleet of turbines or changing filters?

Upgrading intake filters is the best method of cutting CO<sub>2</sub> that doesn't require additional infrastructure or a high capital expenditure. Since gas turbines already use air filters, their inlet systems can generally be upgraded using the existing infrastructure. Upgraded filtration requires an initial investment, but that cost increase is far less than the operational cost savings achieved each year.

Improved air inlet systems are the simplest and smartest way to reduce the CO<sub>2</sub> intensity of your operations. They also improve engine performance so that your turbine engines produce more power at a lower environmental impact. **Boost to reduce!**

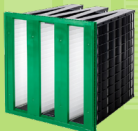


## 3 FILTER FEATURES TO CONSIDER

EPA  
EFFICIENCY

HYDROPHOBIC  
CONSTRUCTION

LOW & STABLE  
AVERAGE DP



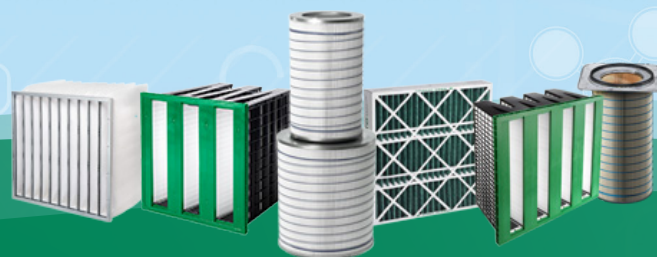
Be aware that not all filters are created equal.

# Camfil Power Systems

## Camfil – a global leader in air filters and clean air solutions

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment. We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem-solving, innovative design, precise process control and a strong customer focus we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has 30 manufacturing sites, six R&D centres, local sales offices in 30 countries, and 4,500 employees and growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment, visit us at [www.camfil.com](http://www.camfil.com).



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For further information please contact your nearest Camfil office.

CAMFIL - Clean Air Made for Improving Life