

# Calculating the carbon footprint of AKHS operations

## Measuring the Carbon Footprint of Health Facilities

In order to reduce the carbon footprint of Aga Khan Health Services (AKHS) facilities, it had to first be measured. But at the beginning of AKHS' efforts in 2019, existing tools, such as those available for calculating the carbon emissions from electricity and transport, were found to be far from intuitive. Such tools required prior knowledge and following instructions for each data set. Furthermore, available tools did not cater to the range of contexts, units and items that applied in Lower Middle Income Countries (LMICs) nor did they include elements essential to calculate the footprint of the health sector. Had AKHS worked with what existed at the time, at least eight different products would have been needed.

Additionally, many used out-of-date carbon conversion factors or lacked data for countries where AKHS works. The quality and consolidation of outputs designed to formulate a clear baseline and measure targeted activity would in itself have required considerable expertise. There were also no available tools at the time for some important products, such as inhalers and, most significantly, the supply chain – which was known to account for upwards of 70 percent of the health sector footprint in other countries where this had been previously estimated. Many tools also depended on internet access and would therefore have been difficult to complete if there were interruptions in power supply.

A decision was therefore taken that AKHS would develop a tool that would work in LMICs. The tool would be transferable to other stakeholders within health as well as sectors other than health. The design specifications for the tool included: an all-in-one tool for all data sets that uses readily available data, is simple to use without any prior knowledge in the field, and functions in a way that educates users, including the provision of costing information and diagnostic dashboards to help identify hotspots and inform users about corrective actions.

## Developing a Tool

Through a joint initiative by The Aga Khan Health Services and Aga Khan University, such a tool was developed and tested through several cycles in the field. The tool consists of an Excel-based calculator. It converts readily available data from health facilities and community-based programmes into instant carbon reports. These reports, which are based on international best practice and current carbon conversion factors, then support local and central decision making and planning.

Inputs include data on energy use (electricity, diesel and the full range of local fossil fuels/gas as well as solar), travel, anaesthetic gases, inhalers, contractor logistics, waste, and water and the amounts spent on the different types of items procured. The tool also allows for costing the impact of making changes.

Perhaps most importantly, the tool takes minimal training for non-specialists to master. This was an advance, particularly as international conventions for reporting carbon emissions categorise data by “Scopes”\* which many non-specialists find hard to grasp. AKDN's tool does not require knowledge of the theory of “Scopes”: it automatically organises data by Scopes, through the use of simple “Yes”/“No” answers to questions, such as: “Is this building owned by your organisation?”

The tool generates diagnostic dashboards to identify emissions “hotspots” at overall operations and facility levels. Prompts and notes also help to guide users to consider some of the ways in which they may reduce their emissions.

It is a small file, rather than a web-based calculator. This means that the tool can be easily shared by colleagues over email and completed offline – an important consideration for many of areas where internet access is unreliable.

Since the launch of the first version of the tool in 2020, all Aga Khan Health Service country operations (397 health facilities and hospitals in eight countries) now use it to report data on a quarterly basis.

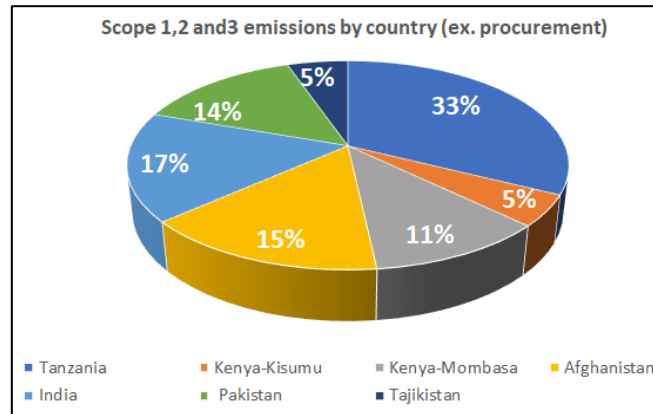
## The results

From the most recent data, quarterly emission for AKHS operations were 19,435t CO<sub>2</sub>e. This figure includes indirect emissions from our procurement (85%) and 2,919t CO<sub>2</sub> for activities directly related to our operations.

### Carbon footprint from quarterly reports

The figure below (Fig 1) shows the country level split of the emissions which are reported in detailed quarterly reports from our country operations. Quarterly reporting covers all Scope 1 and 2 emissions, some Scope 3 emissions and a range of other environmental indicators. Some high carbon procured items, such as construction materials and inhalers, are also reported quarterly. A more complete picture of the carbon emissions from our procurement is provided separately in Table 1. AKHS uses both approaches to derive the most complete picture possible, while also ensuring that no items are double counted.

Fig 1: The Contribution of Country Operations to AKHS' Carbon Emissions

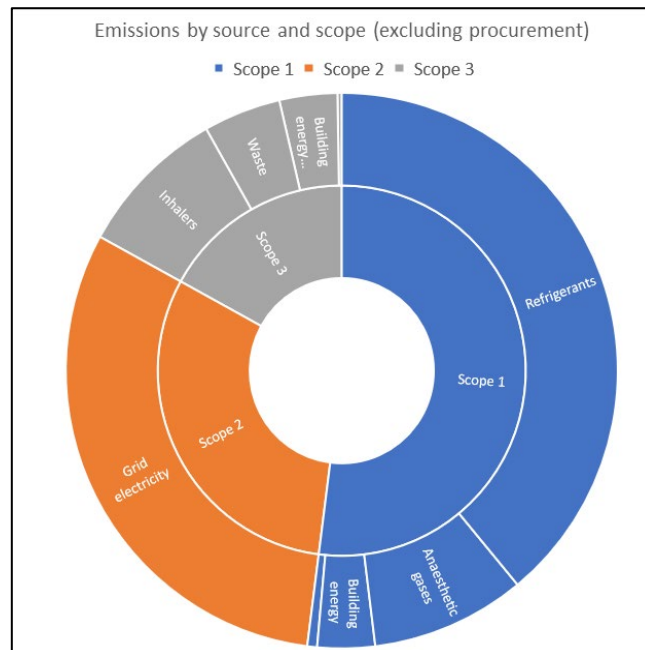


*Fig 1 Legend: The pie chart above contains comprehensive data from Scope 1 and 2 and some of the data for Scope 3. Scope 1: Direct emissions from owned and directly controlled sources e.g., vehicles & generators; Scope 2 - Indirect emissions from purchased electricity; and some information from Scope 3 indirect emissions, such as from high carbon purchased items e.g., inhalers, construction materials, fuel used for rented buildings, travel using public or commercial transport.*

### Examples of country profiles from quarterly data

Figure 2 illustrates the kinds of maps generated by quarterly reports by country operations. As above, this figure includes emissions that arise directly and indirectly from our operations and some data on indirect emissions that arise from our consumption of selected high carbon items. Such maps indicate where country teams need to target remedial actions and can also be generated for individual facilities.

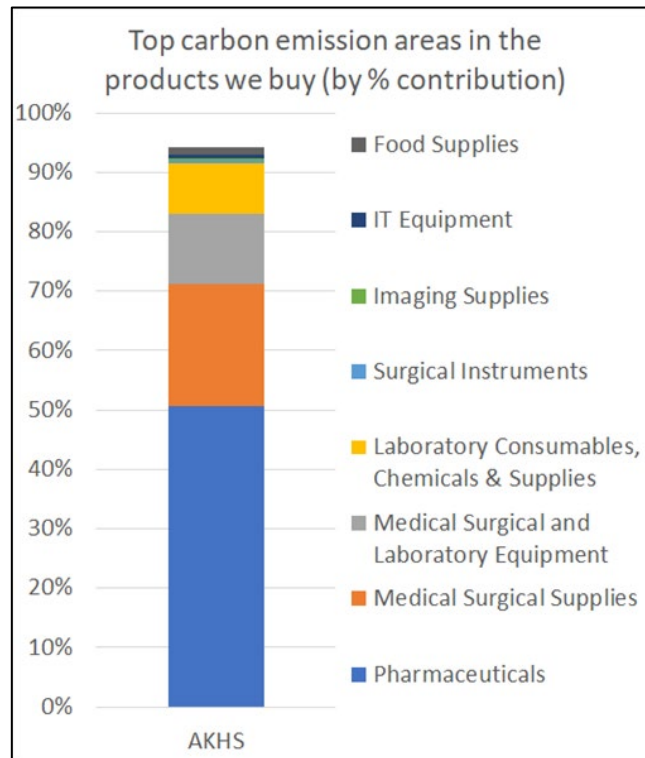
Fig 2. An Example of Analysis by Source and Scope



## Procurement

The items purchased by AKHS account for between 70-90% of the total carbon footprint across country operations.

Figure 3 The Percent Contribution to Emissions of Products Purchased by AKHS



*Fig 3 Legend: The proportion of carbon emissions by categories of products purchased.*

Ideally all healthcare suppliers would report the carbon emissions related to the products and services which they supply, or at least the carbon emissions intensity of their businesses. Currently, only about one third of AKHS's larger suppliers publish their own corporate carbon emissions intensity. The next best approach is to use national data sets for the carbon emissions intensity for different types of products or industry sectors. The analysis to support this is not publicly available for the countries where we work.

Given this situation, AKHS uses a proxy approach to estimating the footprint for the items it purchases. This approach is based on first tabulating how much is spent (in monetary terms) on different categories of items. This information is then cross-referenced with published UK carbon emissions intensity factors for different types of products. This provides average carbon figures for similar groups of items. While the factors we are using are not specific to the countries we are working in, foot printing in this way allows us to quickly identify carbon hotspots to focus on, and which suppliers we need to work with to improve and reduce our procurement emissions.

AKHS has built a function into our reporting tool that allows us to refine our footprint further, as better data becomes available from the larger companies that we purchase from. In this way we are continually improving the quality of our procurement carbon footprint.

Table 1 below shows the split of emissions once procurement, and bottom-up quarterly footprints are combined. Procurement emissions are covered in the top half of the table. This highlights the categories of products which contribute most emissions across country operations. The bottom half of the table covers data collected from quarterly reports. This highlights emissions hotspots, including Scope 1 and 2, from our direct use of resources and high carbon products.

AKHS's operations in country "H", for instance, are mostly community-based outreach activity. As such the spread of emissions sources is different to operations in country "B" or "C", which are mostly hospital-based, with a larger supply chain of pharmaceuticals and medical products.

Overall, 80 percent of AKHS' emissions result from four procurement areas (pharmaceuticals, medical surgical supplies, medical surgical and laboratory equipment and laboratory consumables chemicals and supplies). Identifying this allows procurement teams to target their efforts to reduce emission on the products and suppliers that fall within those categories.

Most direct emissions come from energy use, refrigerant leaks, and vehicles, though anaesthetics make a significant contribution. This data allows country teams to target efforts to reduce our direct emissions.

For further information on the tool or our approach, please contact: [healthcarbonfootprint@akdn.org](mailto:healthcarbonfootprint@akdn.org)

Table 1. The percent of emissions by area of procurement for country operations

	% emissions by area	AKHS A	AKHS B	AKHS C	AKHS D	AKHS E	AKHS F	AKHS G	AKHS H	AKHS I
<b>Scope 3</b> procurement emissions (Accounted using bottom-up spending data and top-down UK factors for the carbon intensity of products and services)	Pharmaceuticals	34.20	48.20	58.40	7.20	50.00	38.60	57.30	0.00	32.00
	Medical Surgical Supplies	15.30	21.10	9.30	8.40	26.40	28.80	0.00	0.00	3.40
	Medical Surgical and Lab. Equipment	12.40	13.50	8.80	11.90	0.00	2.60	0.00	0.00	42.00
	Lab.Consumables, Chemicals & Supplies	8.50	8.60	9.60	0.00	3.10	8.70	36.90	0.00	4.30
	Surgical Instruments	0.00	0.30	0.90	0.00	0.00	0.00	0.00	0.00	3.30
	Imaging Supplies	0.20	0.40	0.40	0.00	0.00	0.30	3.50	0.00	0.40
	IT Equipment	1.30	0.40	1.00	0.60	0.00	0.00	0.00	8.10	0.20
	MRO Supplies	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Food Supplies	0.90	0.90	0.80	0.00	2.00	1.60	0.00	0.00	0.50
	All other purchases	4.40	2.00	2.20	8.20	5.10	0.80	2.20	7.50	4.00
<b>Scope 1, 2 and 3</b> Operational emissions (Accounted using bottom-up resource use data and bottom-up carbon factors)	Construction	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.10
	Electricity	13.30	1.30	2.60	12.60	0.00	13.70	0.00	0.00	4.00
	Staff Travel (by air, land and sea)	0.90	0.00	0.00	5.50	0.00	0.00	0.00	0.00	0.00
	Vehicles Fuel	0.30	0.60	0.00	16.00	2.40	0.00	0.00	60.00	3.70
	Anaesthetic gases	0.90	1.20	0.90	3.40	0.20	3.80	0.00	0.00	0.00
	Refrigerant gases for cooling	2.40	0.20	3.20	2.10	0.60	0.00	0.00	0.00	0.10
	Waste Incineration	0.50	0.60	0.40	0.60	0.60	0.50	0.00	0.00	0.00
	Inhalers	1.20	0.20	0.70	0.10	0.00	0.00	0.00	0.00	0.00
Building fuels, diesel, gas etc.	3.40	0.60	0.60	23.20	9.70	0.50	0.00	24.40	2.00	

Table 1 Legend: The percentage of emissions by procurement category and country operations. [The data highlighted in pink are generated from more accurate information on these items.]

AKDN presented this tool to a WHO Expert Meeting on Measuring Carbon/Environmental Footprint in Health Care Facilities on 24 February 2021.

\*Scope 1 reflects direct emissions (from items the operation owns and controls); Scope 2 reflects indirect emissions from purchased electricity; Scope 3 reflects the footprint of items procured, services used (e.g. travel on public or commercial transport and logistics involved in transporting goods), as well as waste generated.