

Green Approach in Clinical Trials



European Society of Cardiology - Cardiovascular Round Table

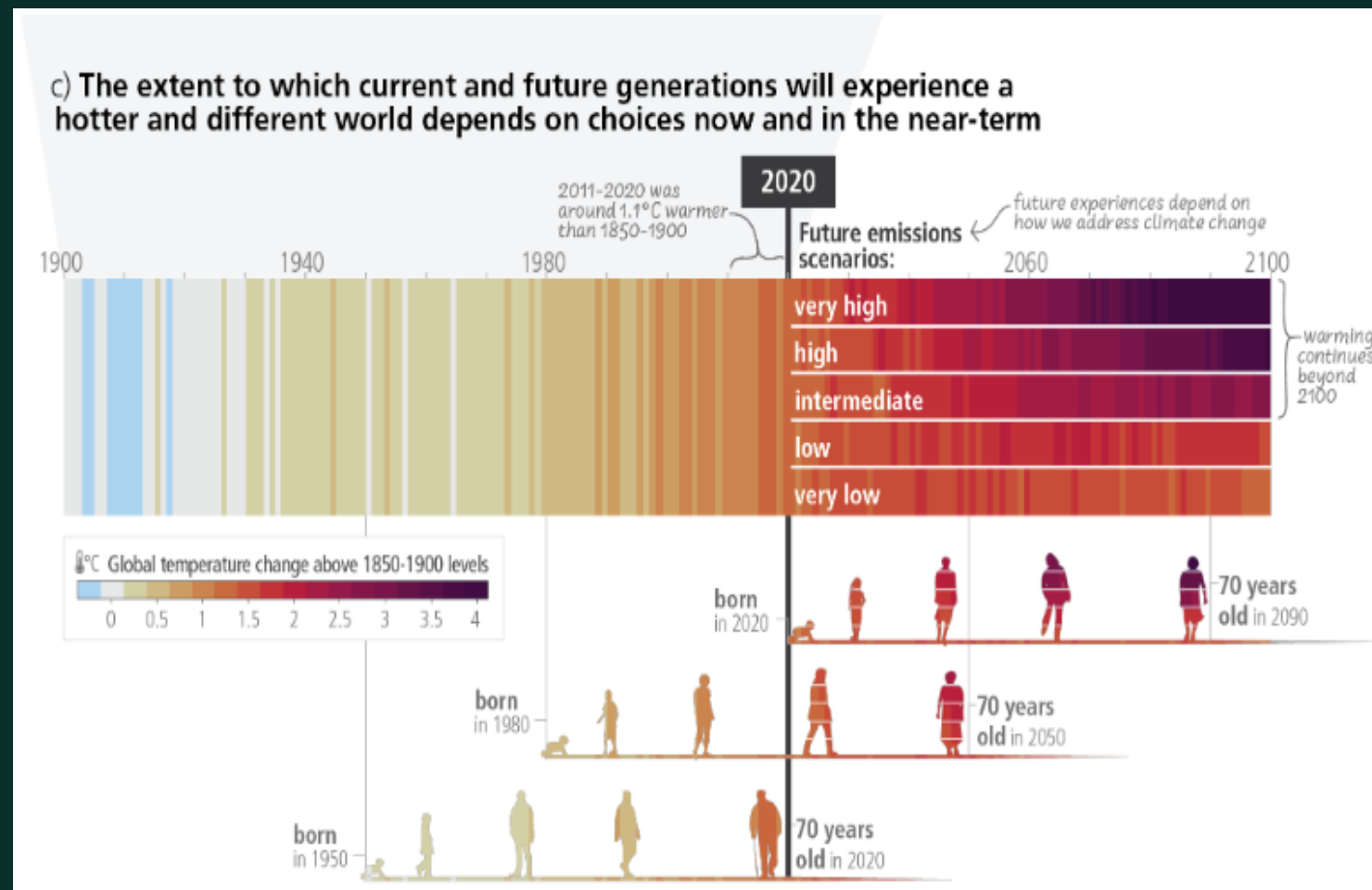
*Dr. Bernd Steffens – Boehringer Ingelheim
Innovation Unit Sustainability Lead Clinical Trials*

Why ?



- Intensified adverse impact from human –caused climate change
- Increased physical climate changes due to human influence
- Current and future generations will experience a hotter and different world

Environmental Footprint and Health come together - there is only ONE planet for all of us



Source: AR6 Synthesis Report Climate Change 2023 by IPCC

Joint Effort in the Pharmaceutical Industry



- SMI launched 2020 by King Charles III. to mobilize industry
- CEO committed to Net-Zero in Healthcare
- Measure clinical trial emissions from 2025 onwards (Phase II/III)



- SMI Healthcare Task Force initiated
- Focus on supply chain, clinical research, patient care



- Multi stakeholder platform – industry, regulators, payers
- Focus transformation, methods and models, guidances and best practices



- Initiative 2023 from SHC
- Development of tools to measure emissions and report, define standards
- Implement sustainability by design

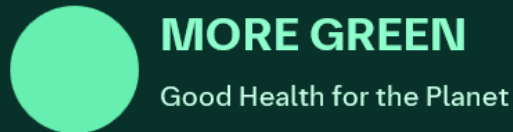
→ **Result: the Clinical Trial Carbon Calculator – free for use**

→ [Link](#)

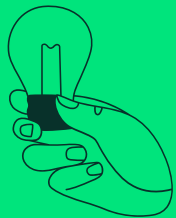
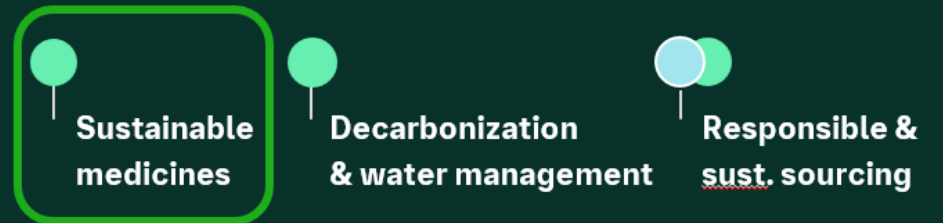
Our Commitment

At MORE GREEN Clinical Trials, we are dedicated to sustainable practices and reducing environmental impact.

By integrating **eco-design** as well as defined MORE GREEN Clinical Trial principles by 2030 we contribute to Boehringer Ingelheim SD4G commitment:



Be **carbon neutral in our operations**, cut our resource footprint by half and continue to create best practices in areas such as water stewardship and waste-to-landfill



MORE GREEN CLINICAL TRIALS goes beyond carbon reduction—it drives **innovation**, aligns with **regulatory** goals, and strengthens our **leadership in sustainable practices**. Through cross-functional and industry collaboration, we **unlock value and cost efficiencies** by “doing more with less.”

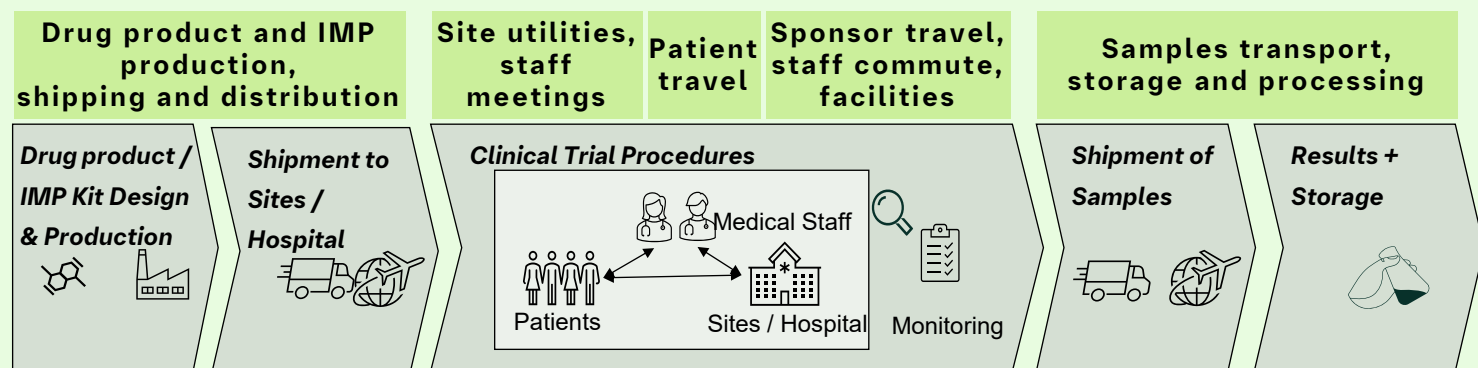
Clinical Trials Have a Significant Environmental Impact

Clinical trials across the industry cause over 100 million tons of carbon equivalent emissions globally every year through manufacturing, logistics, and energy consumption, comparable to 15% of Germany's annual emissions or 50 million flights from Frankfurt to New York. For a participant in Europe, this is an additional 30% of it's average carbon footprint.

Source: «Carbon footprint of industry-sponsored late-stage clinical trials», N. Mackillop et al, BMJ Journals, Aug. 2023, <http://dx.doi.org/10.1136/bm/open-2023-072491>, additional data from Umweltbundesamt Germany, 2025

Simplified Clinical Trial Operations

(Conceptual End-to-End perspective)

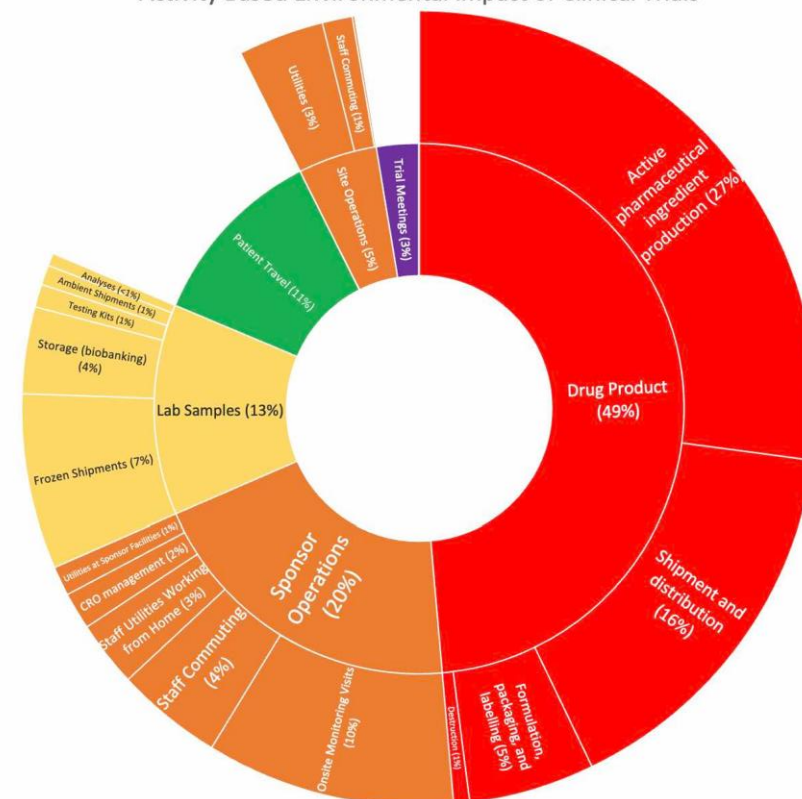


Emission Hotspots

→ High Variability by phase, indication, medication type, interventions, regions



Activity Based Environmental Impact of Clinical Trials



Boehringer Ingelheim Vision and Planning for CT Sustainability

IMP kit manufacture and its distribution is the #1 contributor in CT emissions

Focus is to

-  avoid overages and waste
-  understand hot spot interdependencies
-  create awareness
-  establish tools and processes for eco-design
-  provide guidance at defined integration points via a playbook

Balance is key

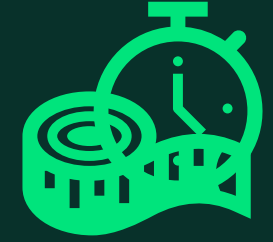


Balance areas

-  drug product overages – shipping frequency and volume
-  materials – locally or centrally sourced
-  lab samples – patient safety, endpoint determination and scientific interest
-  patient visits – on-site visits and virtual visits, decentralized trials
-  monitoring visits – on-site and virtual
-  sponsor meetings – on-site and virtual

Measuring is the foundation

Use case – shipment frequency



Depot Resupply Frequency (months)	# Depot Shipments	# Packages needed	Waste (%)	Transport CO2 Emissions (tons)	Production CO2 Emissions (tons)	Total CO2 Emissions (tons)
1	320	3800	15	144	146	290
2	162	3861	17	76	149	225
3	111	3938	19	48	151	199
4	76	4015	20	38	154	192
5	68	4123	23	31	159	190
6	55	4412	27	26	169	195
7	48	4567	29	24	176	200
8	41	5055	35	21	194	215

Optimum and weight of lever depends on emission level of medication

Measuring → Evaluation → Optimization → Decarbonization → Reporting

Conclusion and Summary

- Eco-Design in clinical trials – any decision has an immediate impact on our climate
- Sustainable clinical trials are possible - and offer increased efficiency and patient centricity

- Key elements
 - Green CMC
 - Recyclability
 - Multi-Use materials
 - Local materials
 - Simulation of material needs and scenarios
 - Decentralized clinical trials
 - Virtual Monitoring and Meetings



Thank you

