



GLOBAL CONTEXT





Megatrends drive need for innovation in agriculture

Growing enough using fewer resources: A fundamental driver for our Crop Science business

Challenges in modern Agriculture

Growing Population

We need to secure a sufficient supply of quality food

+2 bn
people
by 2050¹



+50%
more food and
feed required
by 2050²



-17%
Harvest losses
from climate
change³



-20%
Significant loss in
arable land per
capita⁴ between
2016 and 2050



Pressure on Ecosystems

We have to use natural resources more efficiently and responsibly

¹ UNDESA 2019 (United Nations Department of Economic and Social Affairs, Population Division (2019). World Population Prospects: The 2019 Revision)

² FAO 2017 (FAO Global Perspective Studies)

³ Nelson et. al. (2104); (2) FAO 2016 "Climate change and food security"

⁴ FAOSTAT (accessed Oct 30, 2018) for 1961-2016 data on land, FAO 2012 for 2030 and 2050 data on land, and UNDEDA 2017: World Population Prospects for world population data.

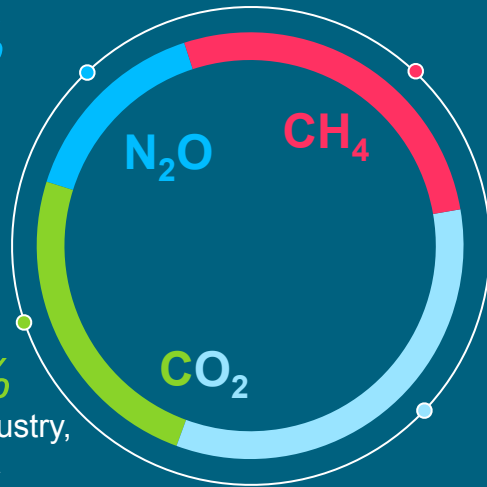


Greenhouse Gas Emissions in the Agricultural Sector

The main greenhouse gases related to agriculture:

15%

Fertilization



27%

Ruminants & Paddy Rice Cultivation

24%

Food Industry, Energy & Transportation

33%

Land Use Change & Deforestation


CO₂
Carbon Dioxide

25x
the impact of CO₂


CH₄
Methane

300x
the impact of CO₂


N₂O
Nitrogen oxide

The global warming potential of different gases is expressed relative to carbon dioxide

Agriculture makes up roughly 25% of global greenhouse gases



Bayer's Commitment





Living up to Our Responsibility

Achieving our transformational commitments by 2030
delivering tailored crop solutions to our customers

> **Advancing a carbon-zero future for agriculture**

30% *Reduction in field greenhouse gases emitted per kg of crops produced*

> **Produce higher-yielding crops with fewer natural resources and inputs**

30% *Reduction in Crop Protection impact on the environment*

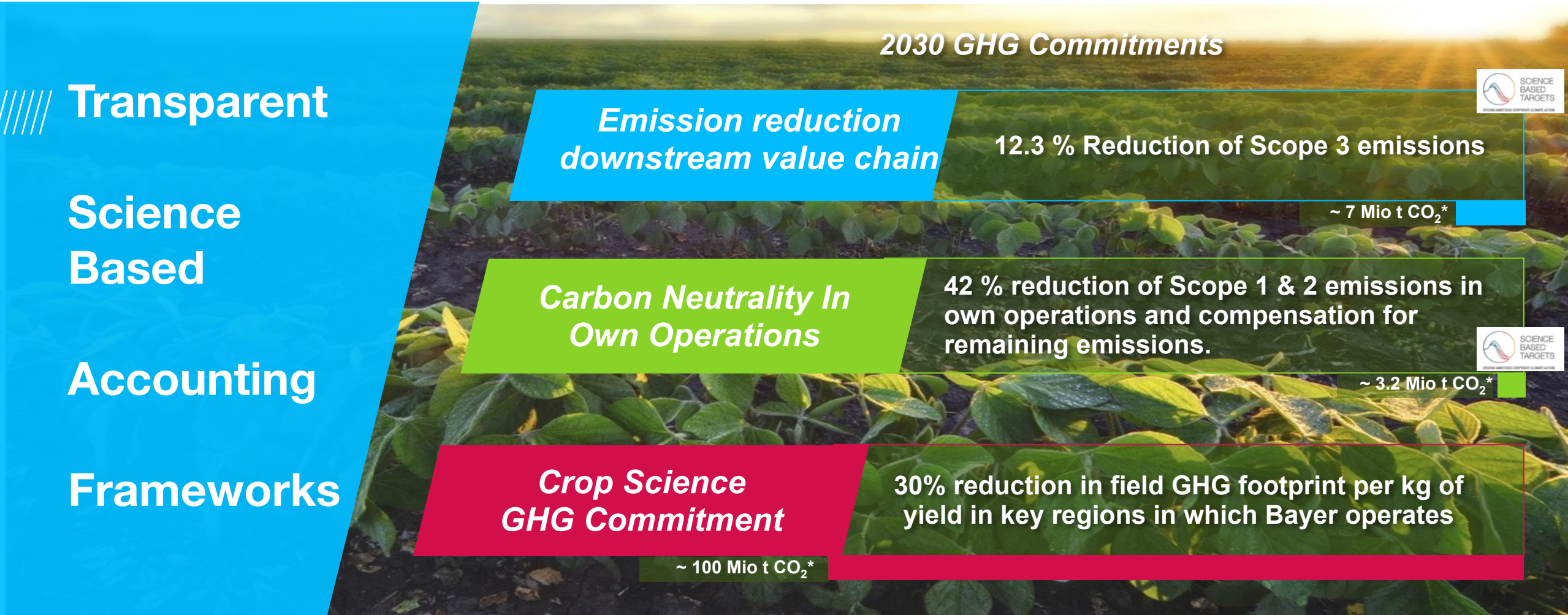
> **Empowering smallholder farmers to access sustainable agricultural solutions**

>100_M *Smallholders benefit from access to education, products & partnerships*





Striving for carbon neutrality in our operations and advancing a carbon-zero future for agriculture



Transparent
Science Based
Accounting
Frameworks



*2029 CS emissions
** SBTi: 1,5°C for scope 1&2 and 2°C for scope 3



Seed Production *in ROMANIA*



Deep Dive



Contribution from our FIELD Production Network



Digitalization to support Sustainability in Seed Production





AM2020 ASP FIELD

Soil Analysis:
+ heterogeneousness
+ texture
+ water holding capacity
+ pH, organic matter, etc. (will follow)

+ an efficient yield, by applying the right amount of fertilizer
+ reducing losses by leaching
+ environmental protection
+ cost reduction

+ custom prescription for each plot
+ optimal density, adapted to the quality variations of the soil
+ reaching the potential of the cultivated hybrid
+ yield maximization

+ fixed seed rate for situations where high or low density is the best solution

+ personalized variable irrigation rate for each field
+ lowering water consumption
+ reducing surface runoff or ponding

+ field scouting
+ data analysis
+ correct recommendations based on data

+ water conservation management and irrigation efficiency based on satellite imagery
+ monitoring plant water intake

+ knowing the real yield potential of each area of the plot
+ informed decisions, by identifying poorly productive areas
+ improving fertilization maps

Electro Conductivity

Variable Rate Fertilization

Variable Seed Script

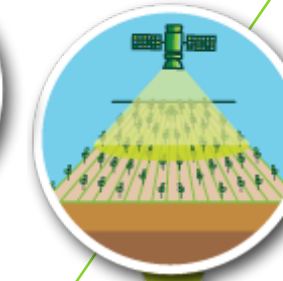
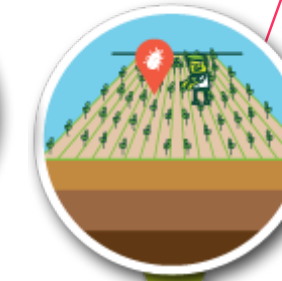
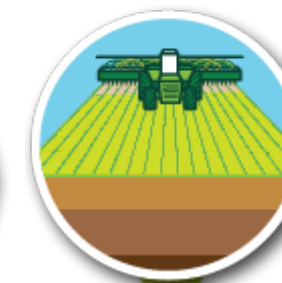
Fixed Rate Planting

Variable Rate Irrigation

Scouting & Data Collection

Satellite Monitoring

Yield Monitor





Sustainability initiatives in Corn Seed Production

1

Better Usage of Water

Irrigation management

Improved water usage efficiency

Variable Irrigation

2

Precision Farming

Adapted plant density to pedological potential

3

Adapted fertilization

Variable fertilization to match the exact need

Fert-irrigation





Contribution from our SITE activity



Site initiative in our SUSTAINABILITY JOURNEY (M2030BEE)

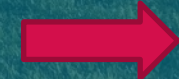
Regional Sustainability
Champions Network
Local ENERGY champions

Solar Panel to support water
heating system

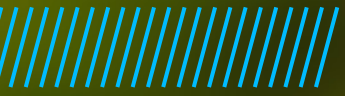
Improving gas burners
Improved electricity
consumption in Plant process

Selecting equipments with high
sustainability ratings in our New
Project
Energy consumption monitoring

Caloric losses in warehouses and
offices
Compressed air losses (indirect
electricity consumption decrease)



**REDUCTION OF CO2 by
14% for 2023**



*Thank
you*

