Farming for the Future
the environmental sustainability of agriculture in a changing world

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The Global Food System in 2050
- 35% increase in food production by 2030 (FAO)
- Access to safe, nutritious, diverse diets
- 4.5% income growth per year for smallholders farmers in poorer countries (to end poverty)
- Improved health outcomes
  - Reduced undernourishment and child stunting
  - Reduced obesity
- Improved resilience and responsiveness to shocks
- Sustainable use of natural resources – land, water, biodiversity, atmosphere

Needed from the Global Food System

Food demand

+50%

7 billion people

9 billion people

2012

2050
### Projected Trends Will Not Get Us There

#### Increase in Food Production (%) by 2030

<table>
<thead>
<tr>
<th></th>
<th>Trend</th>
<th>Vision</th>
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</thead>
<tbody>
<tr>
<td>+20%*</td>
<td></td>
<td>+35%</td>
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* Trend assumes a 2°C warmer world by 2030 and an associated 10% reduction in food crop yields.

#### Income Increase to 2030 (% per year)

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<tr>
<td>2.5%*</td>
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<td>4.5%*</td>
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* 2.5% is 10 yr trend growth (2003-2012) of agricultural labor productivity in low income countries projected forward to 2030; 4.5% is estimated agricultural incomes gains of the poor needed to end poverty by 2030.

#### Health Outcomes (bn people) by 2030

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<thead>
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<tbody>
<tr>
<td>Undernourished</td>
<td>0.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Obese</td>
<td>0.2</td>
<td>0.7</td>
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* Trend assumes 8% undernourishment rate and 6.8 bn people in developing countries by 2030, Vision is 3%.

#### GHG Emissions from Agriculture (% change) by 2030

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<td>+13%*</td>
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<td>-25%</td>
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* Trend: WRI estimates
Three Challenges
PRODUCTIVITY
Feeding 9 Billion People in 2050

Food Production by Region 1972-2050
(Constant 2004-06 US$)

Food Demand By Commodities in 2050 relative to 2005-07
(Billion kg per year)

CEA 2013 based on FAO 2012
ADAPTATION
Climate Change Impacts on Food Systems

Problems Today: 
Short Term Volatility

Recent price spikes for food commodities have been linked to extreme weather events

Issues Tomorrow: 
Medium Term Yield Losses and Increasing Cost Structures

Maize and wheat yields show climate impacts

Uncertain Future: 
Production Collapse in the Longer Term

Maize and wheat yields show climate impacts

1. Australia wheat. 2. US maize. 3. Russia wheat. 4. US wheat, India soy, Australia wheat. 5. Australia wheat. 6. Argentina maize, soy. 7. Russia wheat. 8. US maize.

CCAFS 2014; World Bank 2008
EMISSIONS

Agriculture: Today

LAND USE CHANGE ~11% OF TOTAL

FOREST LAND 63%
CROPLAND 25%
BURNING BIOMASS 11%

TOTAL EMISSIONS

Land Use Change 11%
Agriculture 13%

BUILDINGS 6.4%
TRANSPORT 14%
INDUSTRY 21%
OTHER ENERGY 9.6%
OTHER 9.6%
ELECTRICITY & HEAT PRODUCTION 25%

AGRICULTURE ~13% OF TOTAL

LIVESTOCK 62%
FERTILIZATION 16%
RICE 10%
OTHER 12%

IPCC 2014
By 2050, Agriculture and Land Use Change could represent 70% of Global Emissions - if global emissions are reduced in accordance with a 2C goal, while Agriculture were to remain in business as usual.

By 2050, Agriculture will therefore have to reduce its emission intensity by 60%, if it is to maintain its footprint in parallel with overall emissions reductions. This already assumes emissions from Land Use Change will have fallen to zero.
Solutions
Agriculture Delivering Solutions by Focusing on Three Outcomes: 
Climate-Smart Agriculture (CSA)

- **INCREASED PRODUCTIVITY**
- **ENHANCED RESILIENCE**
- **LOWER EMISSIONS**
Bulgaria can deliver the Triple Win ...

Promoting climate-smart water management

Applying good soil management practices

Strengthening the agriculture risk management tools

Further refining the agriculture information systems (e.g. prices)

Differentiating policies to target sector development asymmetries

Promoting carbon sequestration