Collaboration Overview

AGRICULTURAL TECHNOLOGY ECOSYSTEM IN KENTUCKY

An US/Dutch Collaborative Impact Program

June 18, 2020

AgTech Ecosystem

GROWTH MODEL

With this Agreement we, as part of the Agricultural Tech sector, knowledge & education institutes and governments want to commit to our shared ambition to establish a growth model towards a Ag Tech Ecosystem in the Appalachian Region

Together, our Ag Tech collaboration will create a sustainable & healthy food production system that can help to provide sustainable jobs, and create a healthy diet for many in the US.

Our collaboration will pave the way for the AgTech sector to develop the $10 Billion AgTech market in the US.

OUR IMPACT

BY 2030 OUR GOALS ARE:

- To build a strong, profitable AgTech Ecosystem in Kentucky & the Appalachian region and provide a partner platform which can serve the entire US market.
- Provide more, local, fresh, healthy affordable food to more people.
- Use less land and natural resources in an unpredictable climate environment,
- Create attractive, sustainable, non-seasonal, skilled jobs in this innovative sector.
- Enable Kentucky to grab significant market share in the multibillion-dollar US greenhouse produce market. Make Kentucky the AgTech capital of the US.

Dutch companies, knowledge institutes and the Dutch government are the preferred partners in creating large scale controlled environment AgTech solutions in the US

SIZING & SEIZING THE OPPORTUNITY

- $10 Billion total addressable market for the Dutch AgTech sector
- With a realizable market share between 5% to 10% ($0.5 - $1.0 Billion)
- 30000 direct jobs in the USA
- Serve existing & growing demand
- Healthier food, local for local
- Affordable pricing
- Reduce use of land, water and fossil fuels

Ag Tech Ecosystem

The development of over 6500 acres of greenhouses in the US

Economic Impact

Opens up a $ 10 Billion addressable market for Dutch greenhouse companies

Creates 30.000 direct, full time (non seasonal) jobs in the US

Spurs US job growth in greenhouse related manufacturing, services & technology

Impact on Society

Greenhouses produce high quality, local, healthy fresh food, year round

Delivered from harvest to shelf within 36 hours to 70% of the US population

Environmental Impact

Reduce fossil fuel consumption for imports/ transportation with 80%

Reduce water consumption with 90%

Reduce the need for farm land with a yield up to 30 times higher per acre.

Sources:

- WUR report: '' Market potential and investment opportunities of high-tech greenhouse vegetable production in the USA''
- 2019 Environmental, Social, and Governance Report Appharvest

OUR OBJECTIVES FOR 2020

Build the Business

1. Open a shared representative office in Kentucky for the Dutch companies.

2. Create the business infrastructure and presence to bring Dutch technologies and products into the US market.

3. Develop local manufacturing of target greenhouse and AgTech components.

Create Demand

4. Create awareness and demand for healthier, locally produced, fresh vegetables by a Public-Private promotional effort

5. Find the right chain partners: logistics, (cold) storage and retail partnerships

Develop Knowledge

6. Develop education programs in Kentucky to develop AgTech talent in partnership between knowledges institutes

7. Launch an education/research/exhibition center similar to the World Horti Center in the Netherlands to serve as the regional educational research and exhibition center of the ecosystem.

Access Financing & Funding

8. Craft government policies to spur the development of the AgTech ecosystem in Kentucky.

9. Provide access to capital for both Dutch companies entering the US market and local companies developed in the ecosystem.

WHY START IN KENTUCKY?

- Geographically central location to serve 70% of the US population with fresh crop within 36 hours of harvesting.
- Suitable weather conditions (temperatures, rainfall, humidity, sunshine).
- Kentucky has a large, under-utilized skilled and hardworking labor force.
- Economical and plentiful natural and energy resources
- A business-friendly climate (permits, engineering, legal).

BUILDING THIS ECOSYSTEM REQUIRES A PUBLIC | PRIVATE CONSORTIUM

The commercial opportunity for Dutch companies is compelling. However, one of the lessons learned of greenhouse development is that for a sustainable and scalable growth of the AgTech business, providing techniques and hardware is not enough: an entire ecosystem needs to be created to make this transition sustainable.

All companies involved realize that to create real large-scale business opportunities more is needed in terms of education, building out a comprehensive ecosystem and getting more partners involved. But for each individual company, this goes beyond their scope of business and capacity to take a leading role.

The scale and magnitude of such a program therefore makes it necessary to build a shared ambition & proposition and build a scalable business case with Dutch and US public and private partners.

It is this combination of opportunity and strong partnerships that encourages the parties to enter into this cooperation agreement and take the first step in creating an AgTech ecosystem in Kentucky.

WE ARE IN THIS TOGETHER

- We all have a strong joint commitment to build a successful, profitable AgTech Business Ecosystem in Kentucky.
- We value each other’s contribution, capabilities and complementarity and appreciate our differences in culture and character.
- We fully realize transparency and trust are essential to the success of our partnership.
- It is clear for us that each partner also has their own individual business interests (e.g. reputation, revenue’s, network, knowledge).
- We continuously aim to build a better partnership.
- We will communicate openly, honestly and intensively.
- We share the responsibility for all goals/objectives deadlines, deliverables and budgets,
- We jointly resolve problems & risks. Together.

NEXT STEPS

During the second half of 2020 the following actions will be taken:

- Sign the memoranda of understanding between US and Dutch knowledge institutes for cooperation (exchange programs between students, professors etc).
- Visit to Kentucky by the Dutch public and private partners.
- Set-up of multi-annual action program around a solid business case.
- Set-up of a shared office facility in Kentucky as a launch pad for further action of Dutch partners.

ENTERPRISES

DALSEM

Signify

CERTHON
Greenhouse solutions

Light4Food

PRIVA

RIJK ZWAAN

AppHarvest

KNOWLEDGE

UNIVERSITY OF PIKEVILLE
UPIKE

has
Food Innovation

University of Kentucky

Fontys
University of Applied Sciences

MOREHEAD STATE UNIVERSITY

BEREA COLLEGE

EKU

GOVERNMENT

COMMONWEALTH OF KENTUCKY

Ministry of Agriculture, Nature and Food Quality of the Netherlands

PUBLIC | PRIVATE

NLWORKS

PROFILE OF THE PARTNERS

Companies

1. Dalsem: Dutch family firm specialized in supplying complete, high-tech greenhouse projects, based in Den Hoorn.

2. Signify: Dutch private company (former Philips) specialized in connected LED lighting systems, software and services, based in Amsterdam/High Tech Campus Eindhoven.

3. Certhon: Dutch family firm that designs and builds greenhouses and technical systems for the international greenhouse horticulture sector, based in Poeldijk (Westland).

4. Light4Food: Dutch private firm that develops and builds hydroponic cultivation systems in greenhouses, based in Horst (Limburg).

5. Priva: Dutch family firm that develops hardware, software and services in the field of climate control, energy saving and optimal reuse of water, based in De Lier (Westland)

6. RijkZwaan: Dutch family-owned vegetable breeding company developing improved plant varieties, based in De Lier (Westland).

7. AppHarvest: US private developer of CEA projects. Company's first CEA facility will be commissioned in Morehead, KY, in September 2020.

Knowledge & Education

1. University Of Pikeville (UPIKE): UPIKE is a private, liberal arts university located in Pikeville, Kentucky which developed an AgTech program where students can earn both associates and bachelor degrees.

2. HAS University of Applied Science (HAS): an independent university based in Den Bosch & Venlo specialized in food, agriculture, horticulture, nature and environment.

3. University of Kentucky (UK) College of Agriculture, Food and the Environment: UK is a land-grant university based in Lexington.

4. Fontys: University of Applied Science. Fontys has approximately 43.000 students and offers International Bachelors & Masters programs and exchange programs in in amongst others, business & technology

5. Morehead State University: Morehead State University (MSU) is a comprehensive public university with robust undergraduate and graduate programs, emerging doctoral programs and an emphasis on regional engagement.

6. Berea College: Private educational institution based in Berea, KY, well-known for offering students the opportunity to work in place of paying tuition.

7. Eastern Kentucky University: Public university based in Richmond, KY.

Public

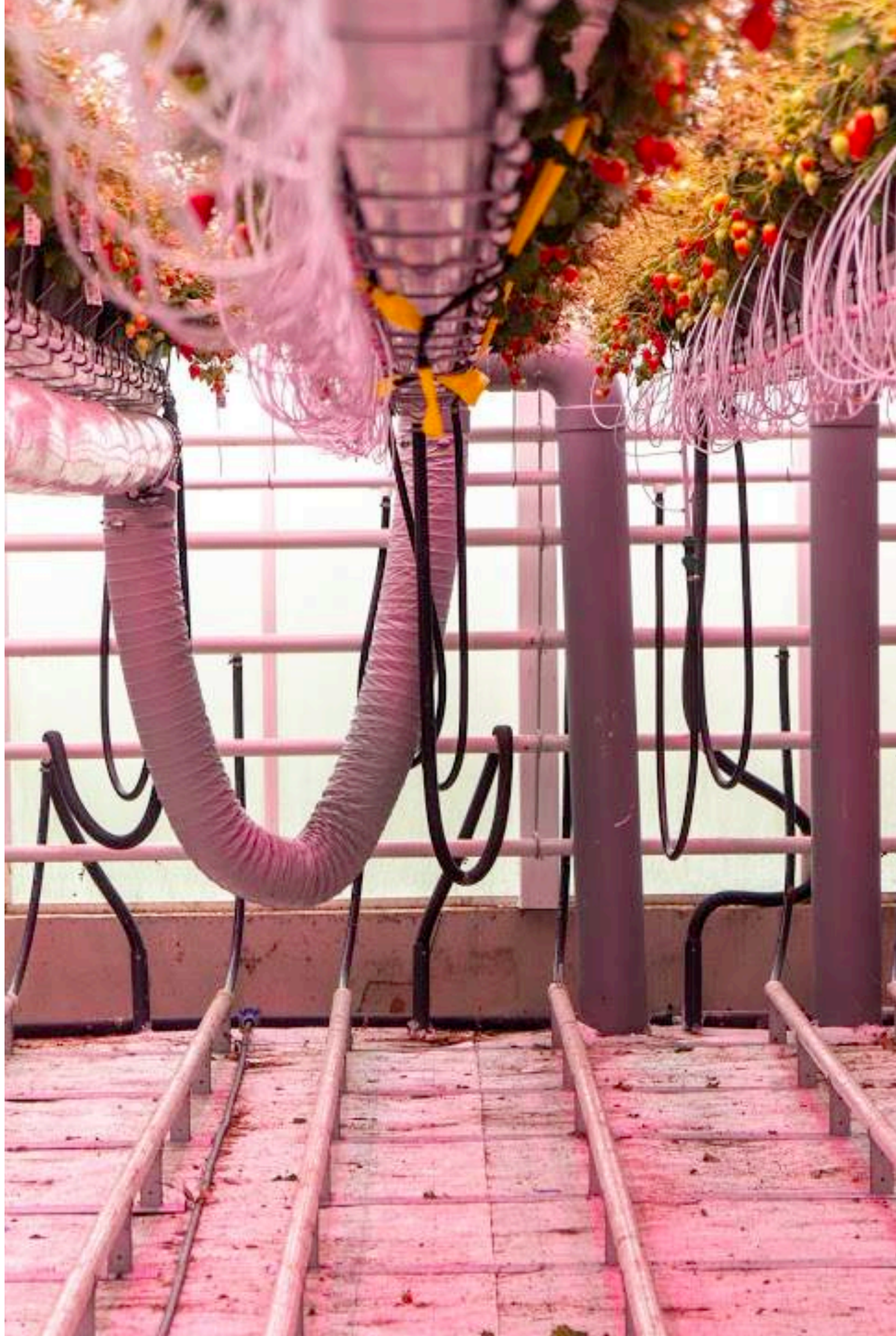
- Commonwealth of Kentucky
- Dutch Ministry Of Agriculture, Nature Food Quality (LNV)

Private/ Public

- NLWorks: public-private network organization initiated by Dutch ministries of Economic Affairs, Foreign Affairs & the Confederation of Dutch business which operate as a broker for set-up of international consortia. Private/ Public

THANKS TO

- The Netherlands Enterprise Agency (RVO)
- United States Department of Agriculture Rural Development (USDA)-Kentucky State
- Dutch Consulate General Chicago
- Dutch Embassy Washington, Agricultural Council
- Wageningen University & Research Centre (WUR)
- Food Valley Wageningen
- SOAR Appalachia Kentucky
- University of Maastricht
- Government of Kentucky State Economic Development Dept.
- World Horti Centre Naaldwijk
- Oost NL (East Netherlands Development Agency)
- BOM (Brabant Development Agency)
- LIOF (Regional Development Agency Limburg)
- Dutch Greenhouse Delta (DGD)
- Topsector Agri &Food
- Brightlands Campus Greenport Venlo



Appendix 1

AGRICULTURAL TECHNOLOGY ECOSYSTEM

Collaborative impact program to introduce a controlled environment AgTech in Kentucky

June 2020

SHARED US-DUTCH AMBITION

A collaboration of 7 companies, 7 knowledge institutes, backed by US & Dutch governments has the shared ambition to establish a controlled environment AgTech ecosystem in Kentucky using Dutch knowledge, products and services. The goal of this public-private collaboration is to capitalize on the controlled environment AgTech opportunities in the US for the Dutch sector: by 2030 growing their export to, and business and investments in, the US significantly. Providing a substantial job growth in this sector in both countries and providing Dutch solutions to local & global societal challenges.

URGENCY TO ACT

Feeding the world becomes an increasingly large challenge. By 2050, global population is expected to exceed 10 billion people, and a changing climate, inconsistent rainfall patterns, and unpredictable growing seasons are already affecting crop yields worldwide. At the same time, more and more arable cropland is built over for cities, as the trend towards urbanization increases internationally. The next generation will face the challenge of growing healthier food for more people while using less land in an unpredictable climate environment. A challenge which Dutch companies & knowledge institutes have taken up quite successfully. US companies, knowledge institutes & governments therefore have turned their eyes to the Netherlands for support; as a preferred partner in creating large scale controlled environment AgTech solutions in the US. The general belief is that the outbreak of COVID-19 will not disrupt this collaboration. On the contrary, both US and Dutch industry parties believe this will have a positive long-term effect for the controlled environment agriculture business initiatives for the years to come in the US.

ECONOMIC & SOCIETAL OPPORTUNITIES

Located in the eastern centre of the Continental US means that 70% of the US population can be reached from Kentucky in one day drive. Tomatoes can be on store shelves in New York, Chicago, Washington DC, and Atlanta within 36 hours of harvesting. Besides its proximity to markets, availability of labour is another competitive advantage; being the number one business challenge to the greenhouse industry worldwide. Kentucky has a large underutilized, skilled and hardworking labour force resulting from the collapse of the coal industry. Additionally, the state has a business-friendly climate that allows for reduced time in construction permitting. Kentucky also has plentiful and relatively cheap natural and energy resources essential for both a greenhouse cluster and a complete AgTech ecosystem. In the past two years Kentucky has experienced record rain fall while other areas of the US have had droughts. This makes Kentucky the ideal place to locate a greenhouse and AgTech hub.

Thanks to guidance of the Dutch embassy network in US AppHarvest – a VC backed company – has been actively seeking alliance with Dutch partners willing to provide AgTech solutions for the build-up of a new ecosystem. With the help of local government & knowledge institutes it launched an ambitious project to implement large scale controlled environment AgTech in the Appalachian region, and making Kentucky THE sustainable 'Ag tech capital of the USA'. Last year AppHarvest started building their first 60-acre facility in Morehead, Kentucky, worth tens of millions of USD using primarily Dutch technologies. Appharvest has the ambition to invest almost $1.5 billion over the coming 5 years; scaling up from 60 to 200 hectares in the near future and for 500 hectares of controlled environment facilities in the Appalachian region in future. Actively supported by state government, as a mean to create a sustainable & healthy food production that can help reduce poverty, provide sustainable jobs and create a healthy diet for many of its inhabitants.

The Dutch AgTech sector can be an important ally tackling these challenges. The commercial opportunity for Dutch companies is compelling, as shown by a Wageningen University study commissioned by the Dutch Enterprise Agency (RVO), Dutch Agricultural Council Washington and NLWorks. However, one of the learnings of greenhouse building in the US is that for a sustainable and scalable growth of the AgTech business, providing techniques and hardware is not enough; an entire ecosystem needs to be created to make this transition a sustainable one. But for each individual company this goes beyond their scope of business and capacity to take a leading role. The scale and magnitude of such a program therefore makes it necessary to have a shared ambition and business proposal between Dutch & US public and private partners. This requires a multi-annual public-private effort based on a solid business case & growth model, and a neutral party such as NLWorks to push this initiative to the next phase.

FUTURE US-DUTCH MISSION

From the Dutch side this initiative has received support from the Dutch government, resulting in an on-stage announcement during the GES meeting in June 2019 by Dutch Minister of Agriculture Schouten of a first business-deal with Kentucky. From then onwards, public and private support for this initiative started to grow rapidly. Last January US Agricultural Minister Sonny Perdue visited the Netherlands in support of this US-Dutch AgTech collaboration, followed by an incoming visit last February organized by the Dutch Enterprise Agency (RVO) and NLWorks. AppHarvest, Kentucky State and regional government and five regional universities visited AgTech hotspots in preparation of finding suitable Dutch consortium partners. NLWorks subsequently stepped in to organize business & knowledge parties in an effort to come up with a Dutch proposal. Subsequently, all parties signed the collaboration agreement in June 2020. Setting the stage for future collaboration.

All participating companies & knowledge institutes are committed to the build-up of a local knowledge and education infrastructure. Starting from a shared local office facility as a launch pad for future joint business activities. Aligning Dutch and US interest and finding the right retail, logistic, knowledge, governmental and financial partners to establish a sustainable AgTech growth model for the future.

APPENDIX 2: COVID-19 EFFECTS ON APPHARVEST BUSINESS

COIVD-19 has created an unprecedented global business environment. AppHarvest is working diligently with our team, partners, and government officials to minimize the effects on our business. To date, there have been minimal negative short-term effects and strongly positive long-term effects for the controlled environment agriculture industry and AppHarvest.

The federal government has issued guidelines which have deemed food supply facilities as critical infrastructure and allows such facilities to remain open. This designation along with the support from the Governor of Kentucky and the extraordinary efforts by our Dutch partners have kept our construction on schedule. Our construction and operations teams are at 100% capacity and all our deliveries of materials remain on schedule. This outstanding work by all involved has enabled us to maintain our scheduled opening date of September 1, 2020.

Additionally, the COVID-19 crisis has created several opportunities and advantages for AppHarvest going forward. The crisis has refocused the attention of both the investment community and consumers on food and food supply. For years, consumers have taken the availability of food for granted. This crisis has demonstrated what a large-scale disruption can do to the food supply chain in the short-term and exposed staggering vulnerabilities if such a disruption continued long-term. The risks of America's increasing reliance on food imports are clear, and a premium has been placed on expanding safe domestic supply. This makes our products and facilities more valuable both in the near- and long-term. Grocers have been forced to re-evaluate their supply chains and reduce the risk of supply disruptions. AppHarvest is well-positioned to be a preferred supplier to US grocers going forward.

Our facility's location in Appalachia has also become even more of an asset. Kentucky is located in the middle of the country and far enough removed from major metropolitan areas to provide a geographical barrier to the rapid spread of the virus. Additionally, the available local labor pool and AppHarvest's steadfast commitment to it will provide a competitive advantage in the controlled environment agriculture industry as other large players who rely on foreign labor struggle with border closures and face insurmountable policy changes to foreign labor in the US.

COVID-19 has demonstrated that AppHarvest and our mission are now more vital than ever. The need for a resilient domestic US food supply has been highlighted by this crisis, and investors, consumers and government representatives have all taken notice. The value and opportunity of our facility and AgTech ecosystem in Kentucky has only increased and will be a vital part of a resilient US food system far into the future.