My name is Eivind Lygren, and I have during 30 years worked within environmental protection, water pollution, water treatment and land based fish farming based on recirculation technology. 10 years as research scientist at the Norwegian Institute for Water Research and the rest in the private industry. I have designed technology and managed construction and operation of land based fish farms. The activity was in several European countries as well as in Norway, and I have i.e. designed what was the largest land based fish farm in the world when put into operation.

At present I design a module based vertical farm concept for producing leafy vegetables. The plant can be symbiotically integrated with buildings with respect to energy, «vertical» land area, physical support, air ventilation/quality, etc. Commercial farms can be from five to one hundred meter high and have a depth of approximately two meter. They will have glass surface, and are believed to be placed even in window sections, allowing the inhabitants to view a «green garden» and prevent annoying sunshine through the windows

The design is based on a vertical shelf carousel known from commercial storage systems. The vegetables are grown in the shelves and receive natural sunshine, but also artificial light when needed. The air circulation is based on the plug flow principle that permits significant removal of atmospheric CO2 as opposed to present food production systems that often add large amounts of greenhouse gases Integrated vertical farms can transform buildings to be neutral with respect to greenhouse gases, and open new opportunities for the production of vegetables and other food items close to where they will be consumed. The CO2 footprint of imported food are often much higher than locally produced due to transport. The result is fresh food produced in plants that can be an important part of the green transition

A punch line summary:

- Low investments and operational costs and low cost vegetables all year round, near market production independent of geographical location and season.
- Removal of significant amounts of CO2 by the use of plug flow technology.
- Buildings placed on agricultural land can all in all «add» farm land
- More than 90 % reduction in water consumption in a global situation with a water crisis created by present food production systems
- 30 % higher content of organic oils in the vegetables by using hydrophonic principle excluding soil as growing media (compared to natural field production)
- Minimal energy consumption by counterweight carousel and symbiotic integration with another building Ecological production (except for the present definition that requires using soil) and no need for pesticides