

# NL

Netherlands

## Professional Onion Storage Benin



# Background & Rationale

- Reasoning behind storage:
  - High price fluctuations throughout the year
  - High postharvest losses in glut season
  - Difficulty to preserve onions during rainy season
  - Food security issues when supply is low
- More professional storage needed to push storage period beyond 1-2 months
- Possibility for adding other commodities:
  - Besides onions, other crops can be used to operate storage facility year round

# Crop calendar

Production	Period	Month												
		J	F	M	A	M	J	J	A	S	O	N	D	
Tomato, okra, amaranth, local vegetables	Abundance													
	Scarcity													
Chilies	Abundance													
	Scarcity													
Onion, garlic, Shallots	Abundance													
	Scarcity													

# Technical solution

- Solution designed by **Go and Grow Farm Solutions**
- Large-scale mechanized onion storage
- Pre-fab modular building
- 1,000-ton capacity
- Can cool down to 1°C
- Can control humidity
- Climate monitoring with sensor technology (temperature, humidity and CO<sub>2</sub>) and a storage computer
- Remote support
- Solar powered solution

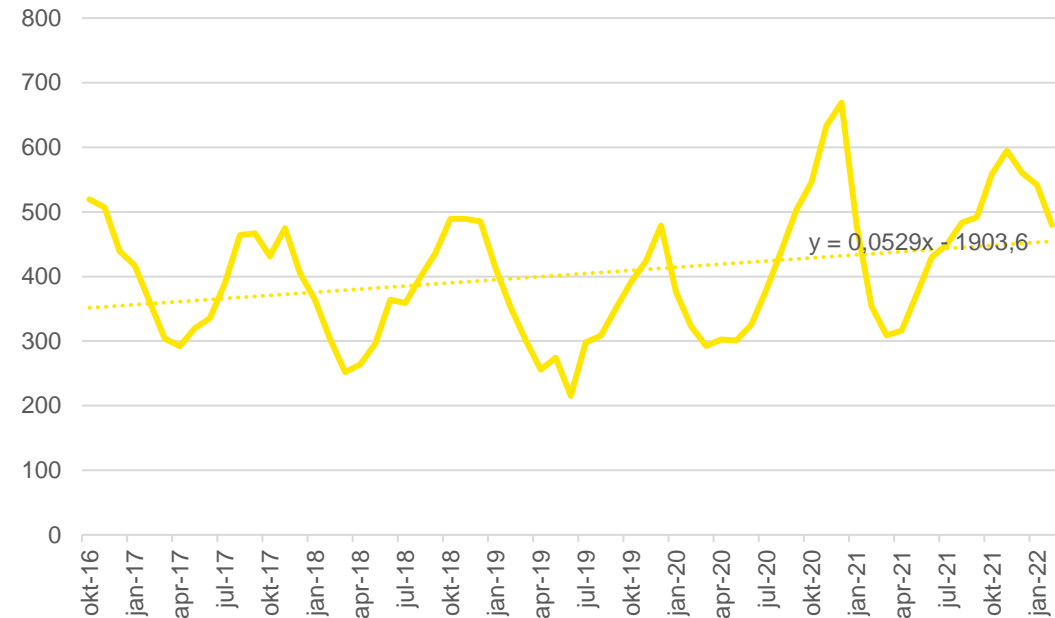




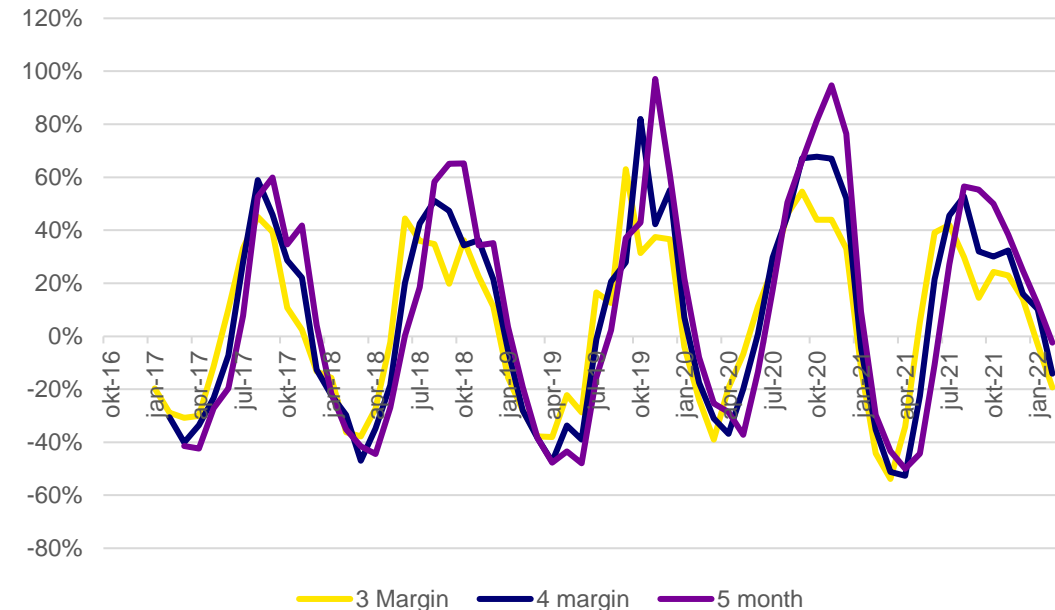
# Onion

- When properly cured, onions can be stored up to five months
  - Agronomists are recommended
- Storing can be at high temperatures:
  - Warm T system at 25-27°C (4-5 months storage)
  - Humidity is decisive factor
  - Limited 'shock' after taking out of storage in rainy season
- Market price data is used
  - Averaged over all markets in Benin
- Clear pricing patterns in seasons
- Margins between Abundance period and Scarcity period range between 50% for 3-month storage and up to 100% for 5-month storage

Monthly Onion Price



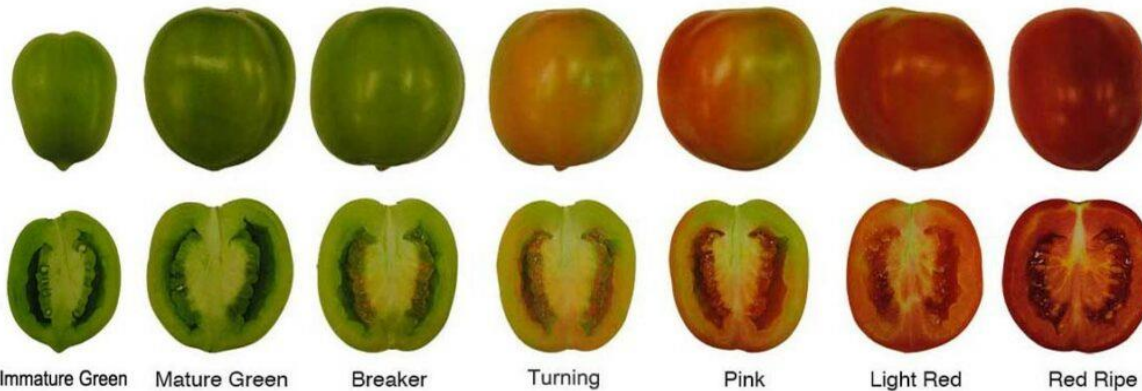
Margin %



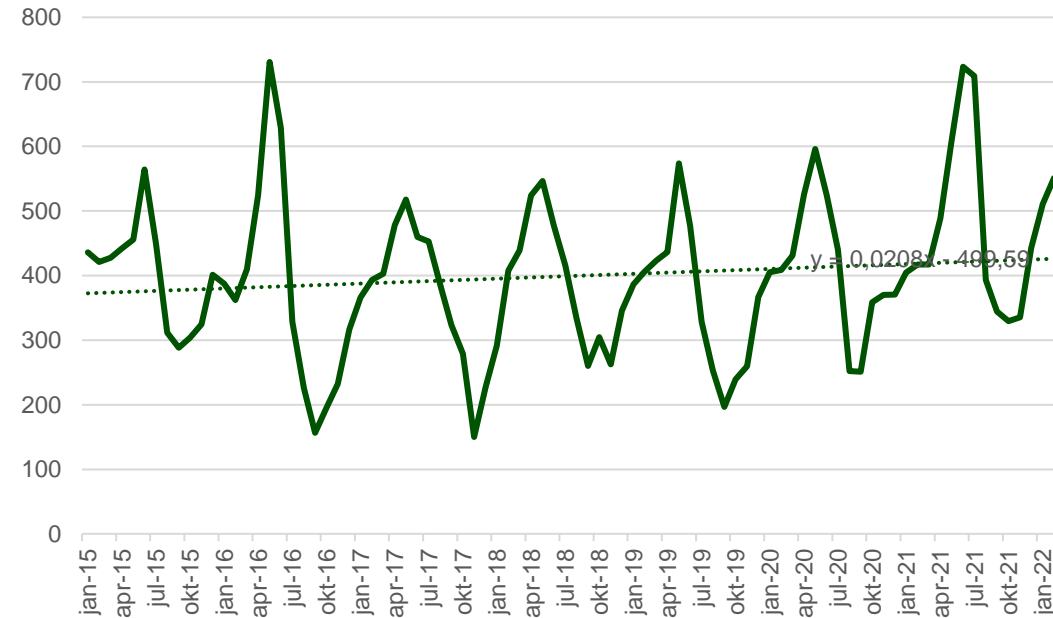
# Tomato

- Mature green tomatoes can be stored for a two to four weeks at moderate temperature (13-15°C)
- Market prices of tomatoes go down after the rainy season and up during the dry
- The maximum margin for a month of storage is 40%
- Possibility to make a positive margin for multiple months in a row

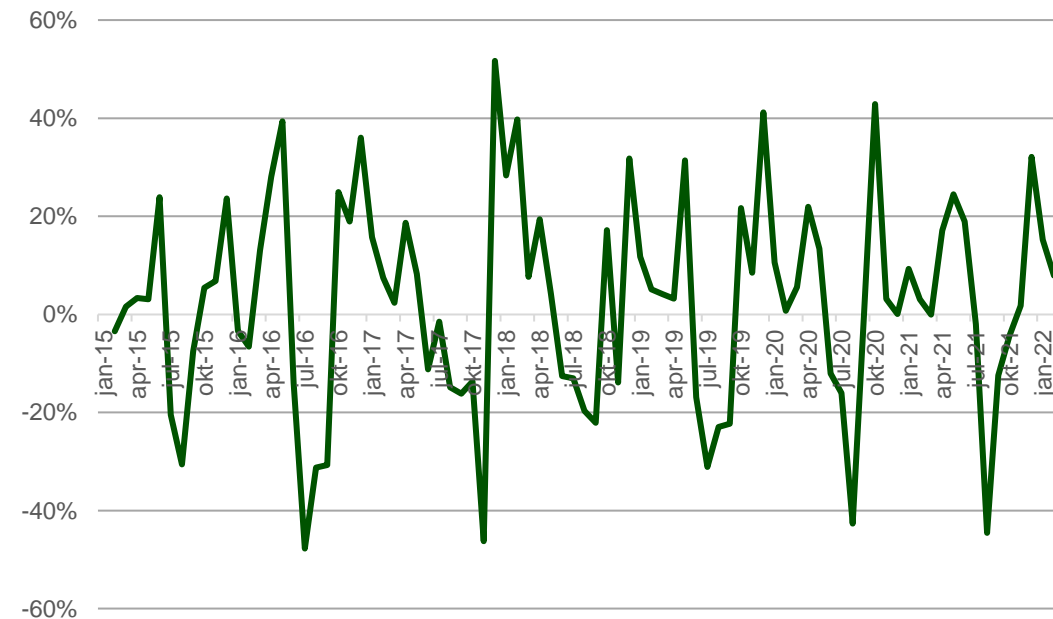
## Tomato Ripening Stages



Monthly Tomato Price



Margin with 1-month storage



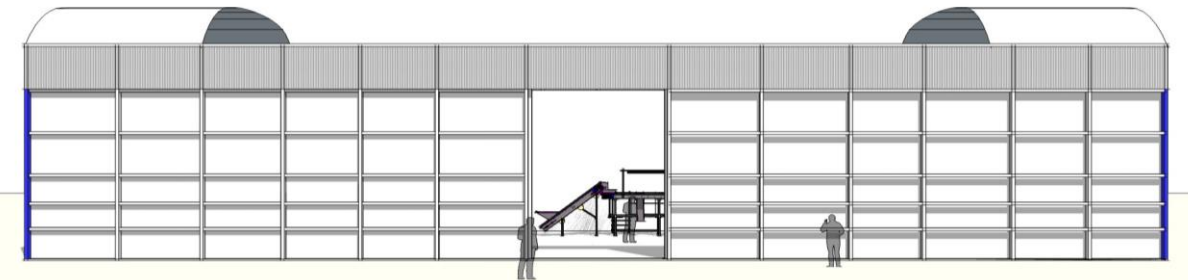
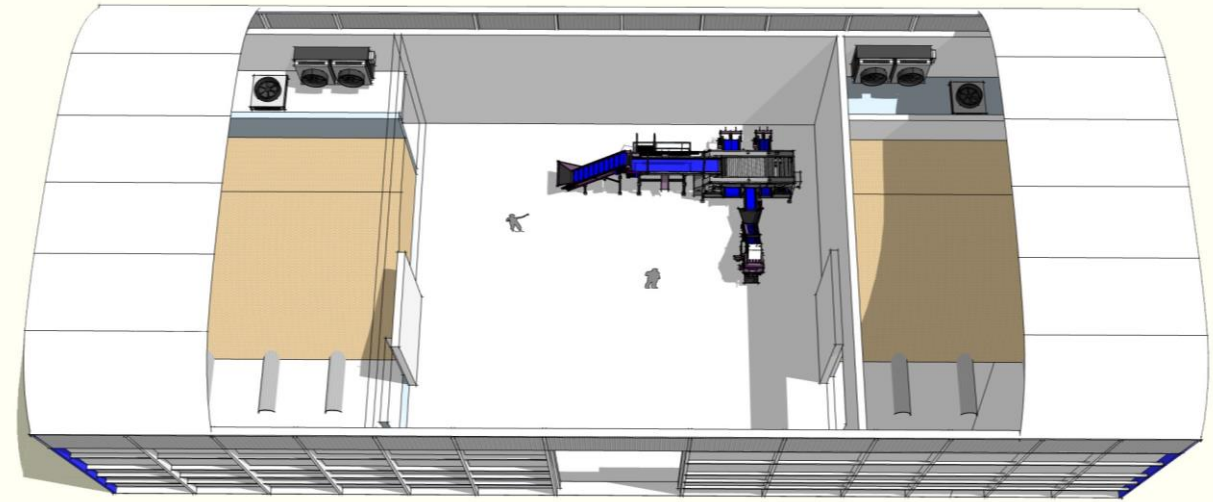
# Storage calendar

- A large margin on onions can be made by storing them for five months (batchwise purchasing)
- Maximum use of capacity: 1,000 tons
- Purchasing during dry period, selling in rainy season
- The potato market is too volatile to 'gamble' on market price fluctuations
- Multiple cycles of tomato storage can be used
- In between cycles, the storage facility needs to be cleaned

Month	Crop
January	<i>Cleaning</i>
February	
March	
April	Onion
May	Onion
June	Onion
July	Onion
August	Onion
September	Onion
October	<i>Cleaning</i>
November	Tomato
December	Tomato

# Investment needed

- Land purchase (1,000 m<sup>2</sup>) EUR 15,275
- Land preparations EUR 78,000
  - Ground works
  - Concrete floors
- Hardware EUR 506,009
  - Steel structure
  - Storage room panelling
  - Storage hardware
  - Pressure walls for ventilation
  - Solar system
  - Automated packaging line
- Transportation<sup>1</sup> and import duties EUR 254,945
- Installation EUR 59,600
- Office building EUR 13,750
- **Total EUR EUR 920,009**
- **Total XOF XOF 603,486,344**





# Operating costs

## Year 1

### Personnel

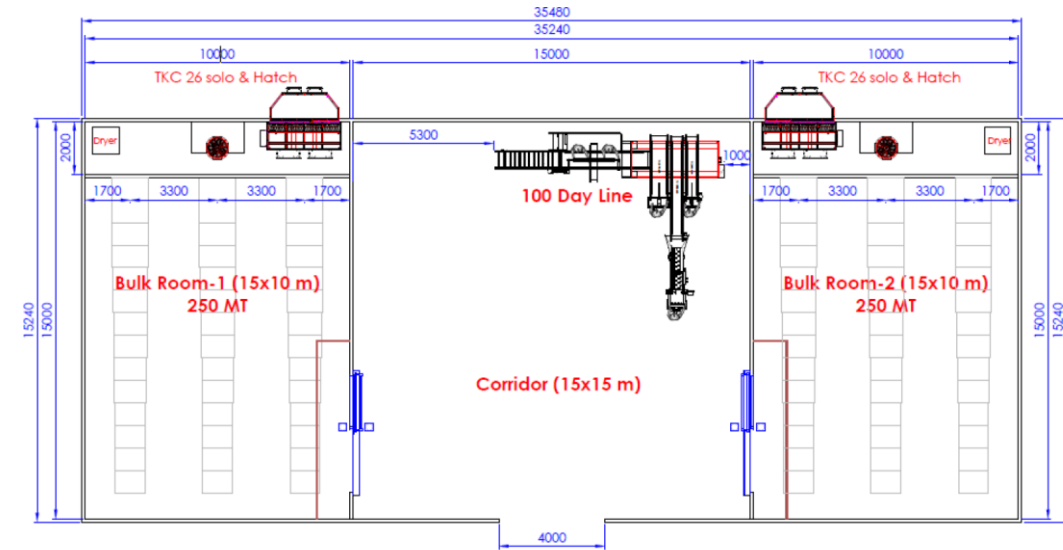
- General Manager
- Accountant
- Agronomists
- Casual labour

EUR 30,000

### Energy costs

EUR 8,900

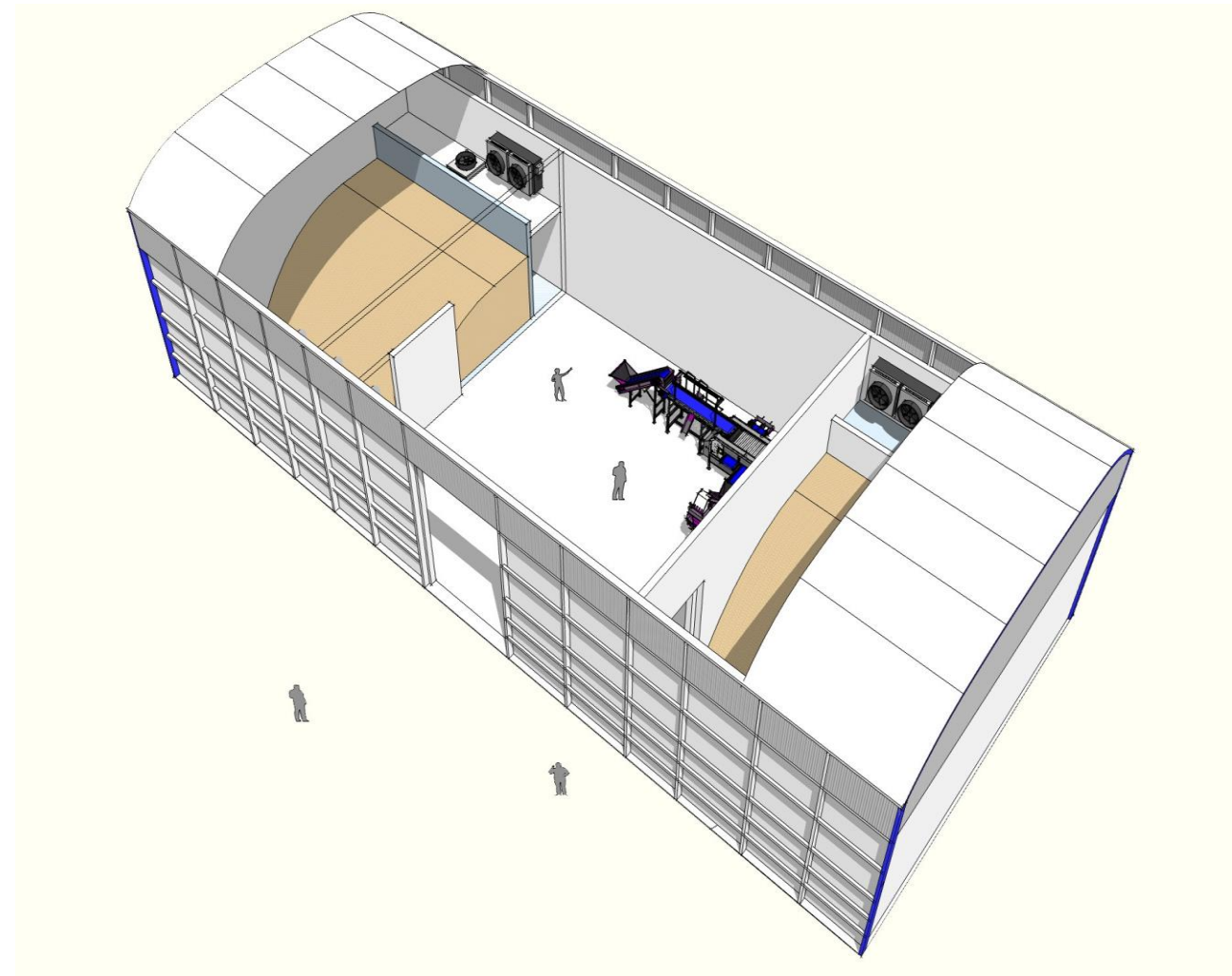
Packaging costs (nets) EUR 2,000



# Financial model

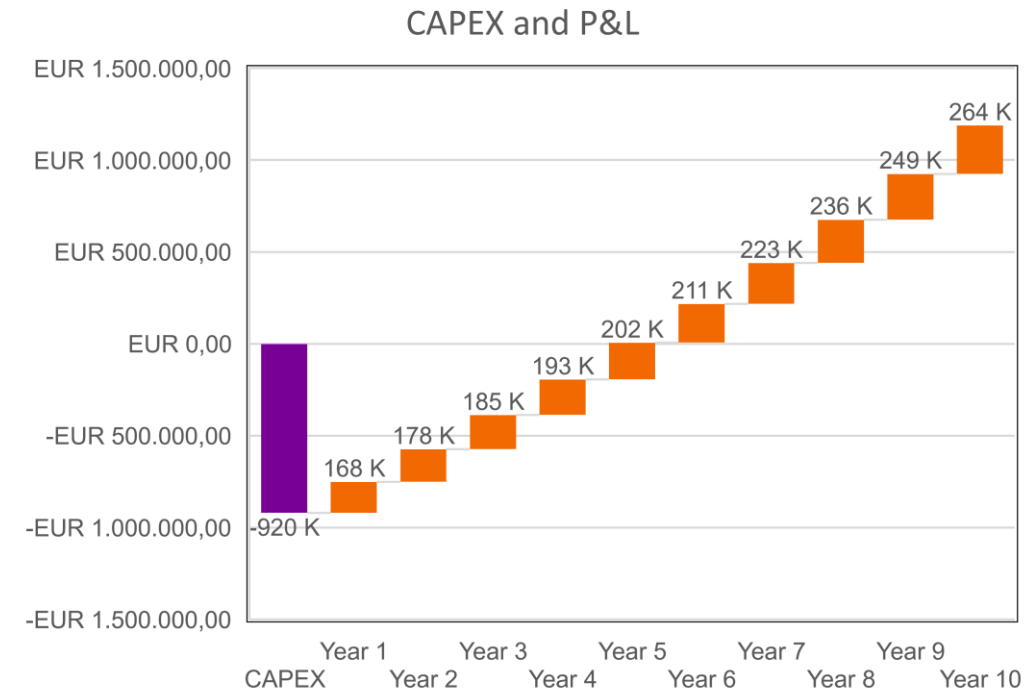
## Assumptions

Location	Sekou
Yearly inflation rate	5%
Annual salary increment	3%
Margin on onions	80%
Margin on tomatoes	20%
Onions unsellable	10%
Tomatoes unsellable	15%
Energy costs	125 XOF/kWh
Daily energy consumption	217 kWh



# Financial Indicators

- Based on the assumptions, the payback period of the investment is 5 years
- The internal rate of return for a ten year period is 17%



Year	Revenue	COGS	Op. Ex.	Net Profit
1	1.751.631	-1.450.088	-46.997	168.490
2	1.839.213	-1.522.593	-48.702	178.068
3	1.931.173	-1.598.722	-50.474	185.378
4	2.027.732	-1.678.659	-52.315	193.205
5	2.129.119	-1.762.592	-54.227	201.576
6	2.235.575	-1.850.675	-56.270	210.510
7	2.347.353	-1.943.163	-58.397	222.803
8	2.464.721	-2.040.274	-60.610	235.724
9	2.587.957	-2.142.241	-62.914	249.306
10	2.717.355	-2.249.305	-65.313	263.581

# Sensitivity analysis

- Big drivers of the business case are the margins and the volume unsellable
  - Current Margin:
    - Onions 80%
    - Tomatoes 20%
  - Volume unsellable:
    - Onions 10%
    - Tomatoes 15%

Onion Margin	Tomato Margin	IRR
90%	30%	29%
90%	20%	21%
90%	10%	12%
80%	30%	26%
80%	20%	17%
80%	10%	7%
70%	30%	22%
70%	20%	13%
70%	10%	2%

Onion Unsellable	Tomato Unsellable	IRR
5%	10%	27%
5%	15%	21%
5%	20%	15%
10%	10%	23%
10%	15%	17%
10%	20%	10%
15%	10%	19%
15%	15%	13%
15%	20%	5%

# Companies that showed interest

- Based on the two webinars and subsequent communication, the following companies showed interest:
  - Agrikoo
  - Africa Green Corporation



# Possible financing mechanisms

- The following financial institutions have shown interest to invest in the business cases:
  - Ecobank
  - Banque d'Investissement et de Développement de la CEDEAO (BIDC)
  - Fonds Arabo-Africain d'Investissement
  - FRAGG Investment Management Limited
  - Agri-Business Capital (ABC) Fund
- **Conditions:**
  - Interested companies need to have sound track record of minimum three years
  - Interest rates of 5-8% per year with one year moratorium are possible
  - Companies will need to provide evidence of collateral / assets

