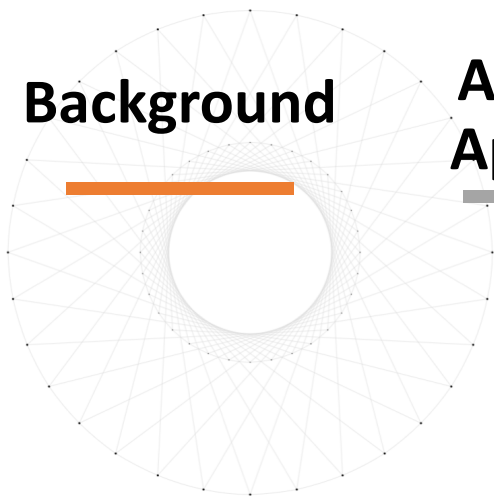


Capacity Expansion Plan

Group 18

Application of Operation Research and Management Science
For Anadolu Efes

Contents



Background

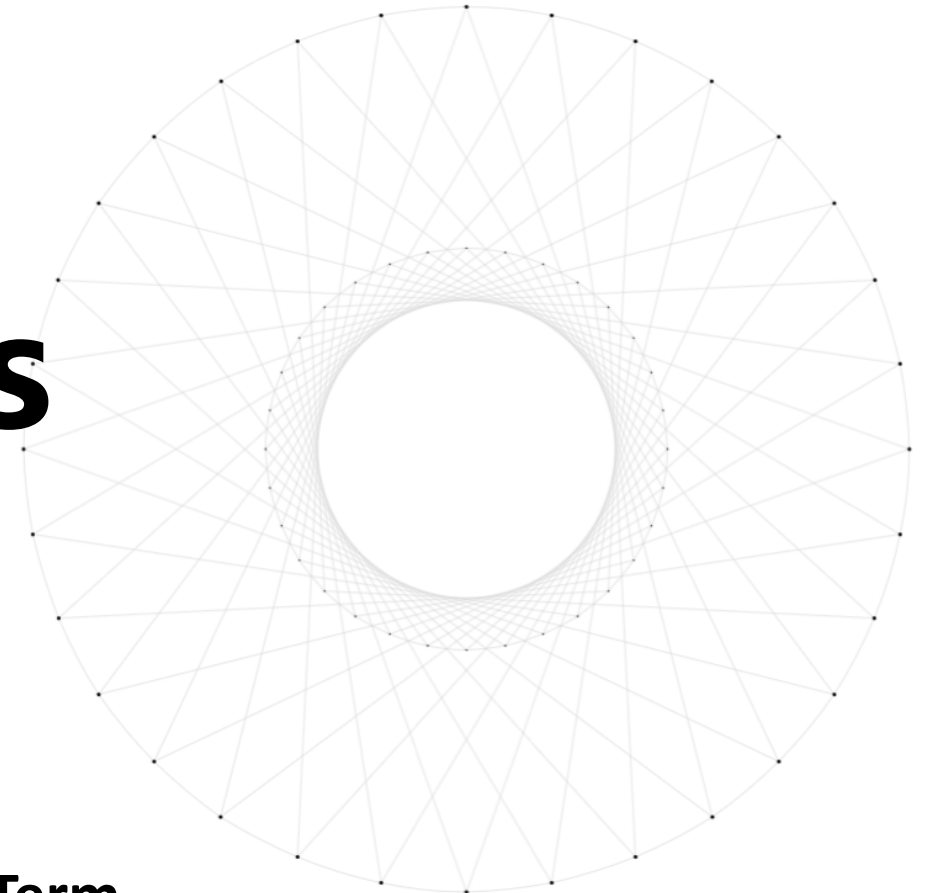
**Analytics
Approach**

**Short Term
Strategy**

**Long Term
Strategy**

Discussion

Conclusion





Background

Background: Problem Analysis

- **78%** market share in year 2000 with **580 million liters** sales

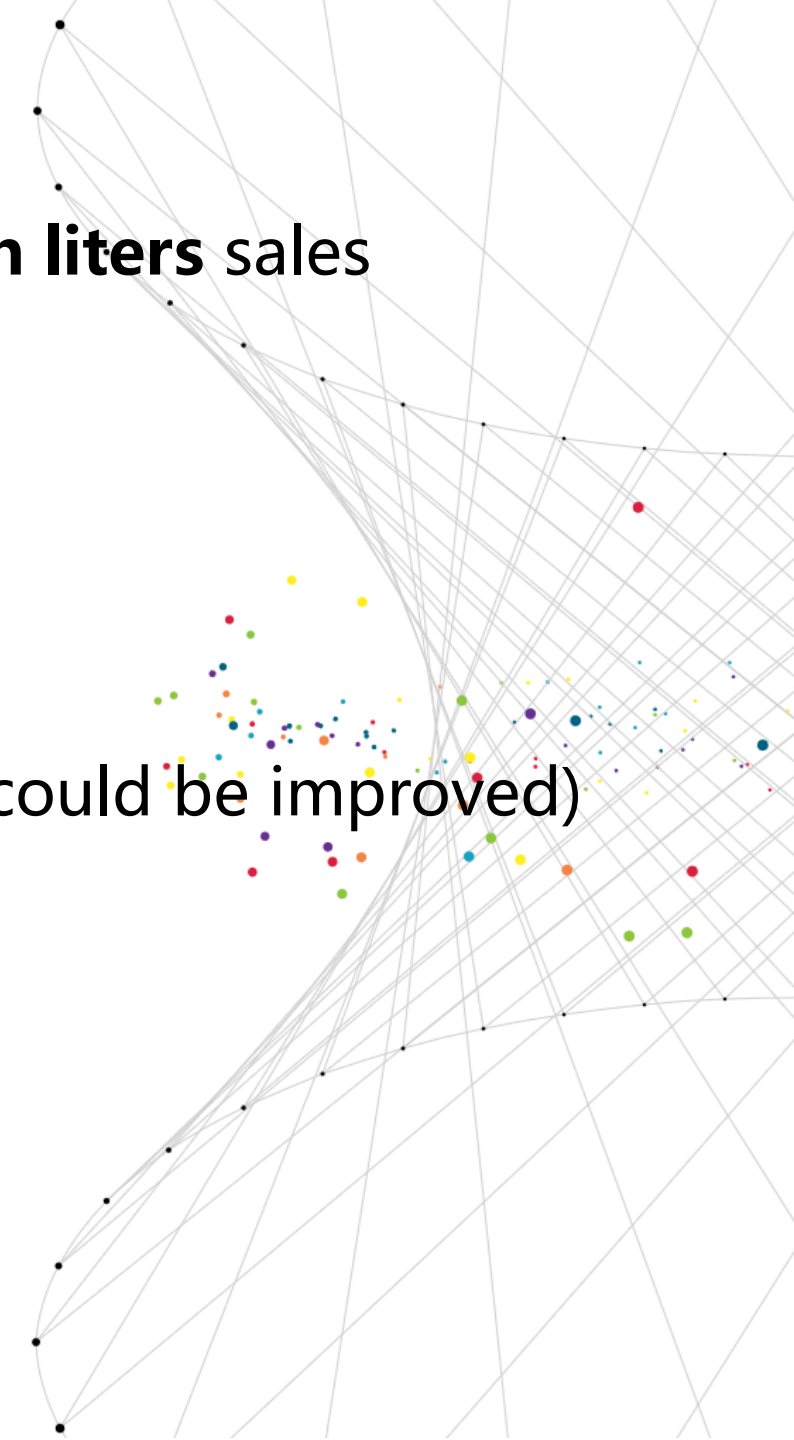
Sales volume keep increasing since 1986 with an average increment 40m liters per year.
Increasing market demand and increasing competition (Turk Tuborg 21% ; Tekel 1%)

- Anticipated demand > Existing production

The goal : increase production capacity to meet the demand(maintain market position)
cost reduction in transportation management

- Transportation cost takes up **25%** of total cost (could be improved)

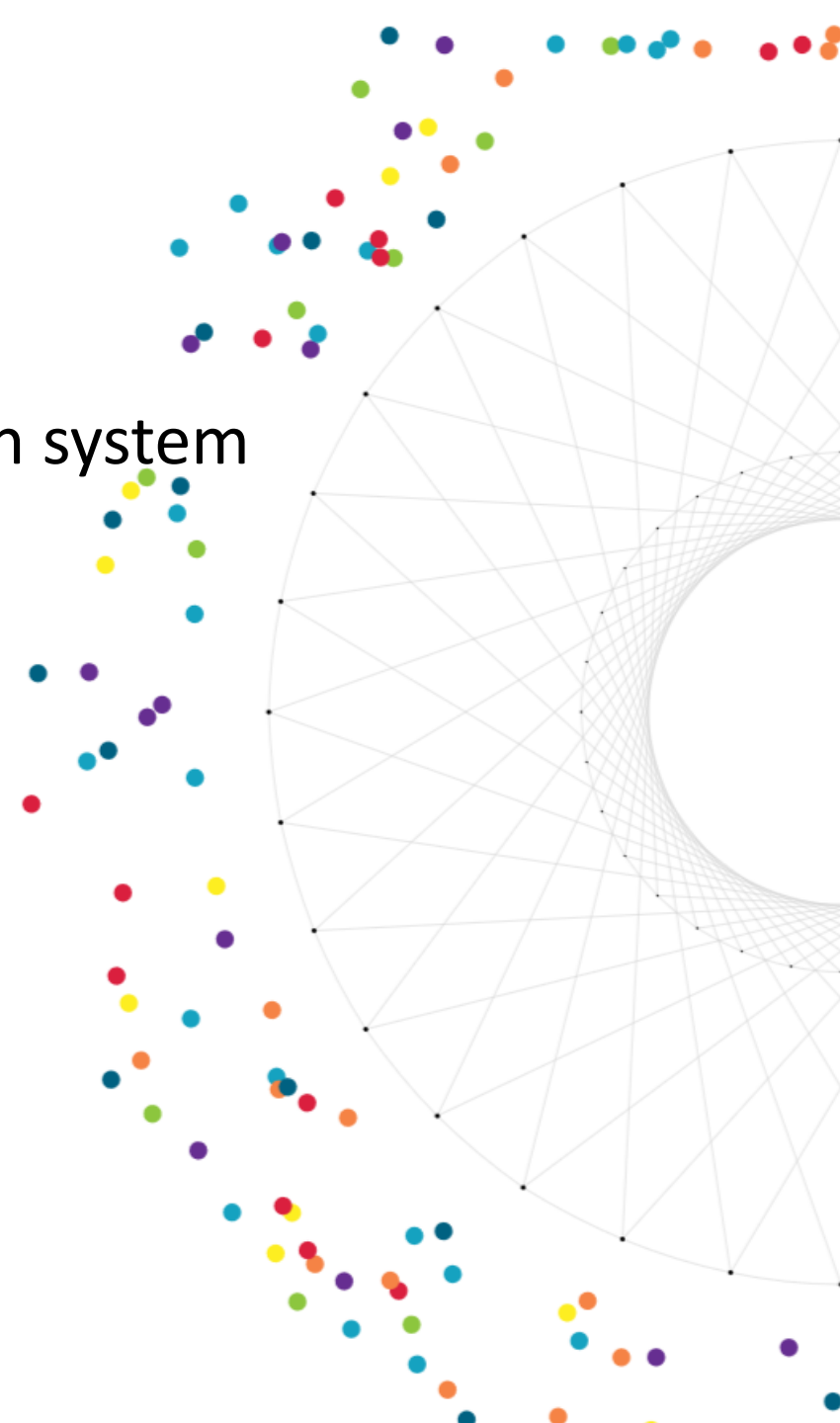
Rearrange the malt and beer shipment plan
New brewery opening and extension



Research Goal

Improving the current production and distribution system

1. Analyse current distribution to **minimise total shipping cost** on year 1
2. Facilities opening/ extension plan to **meet the forecasted demand**





Analytics Approach

Analytics Approach: Available Data



Demand forecast

Three year forecast for each distribution center



Expected transportation cost

Annual shipping cost from plant to distribution center



Brewery Information

Capacity, potential sites, and expansion cost

Analytics Approach: Main Assumptions

Shipping and facility expansion cost covers most of the cost

There are more costs involved in reality

Constant shipping cost

We assumed shipping cost per unit between malt plants and breweries as well as between breweries and distribution centers is constant

10% discount Rate

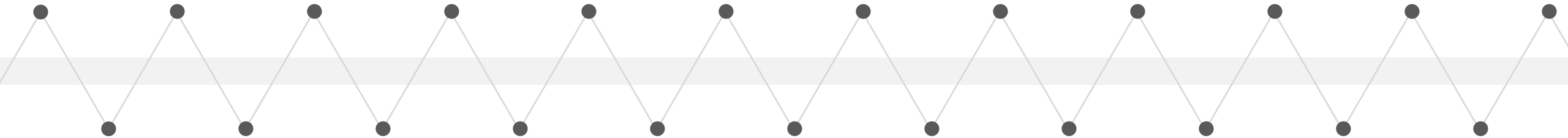
For future cash outflow, it is discounted at 10% to calculate its net present value

Flexibility in shipments

Each brewery can serve any distribution center

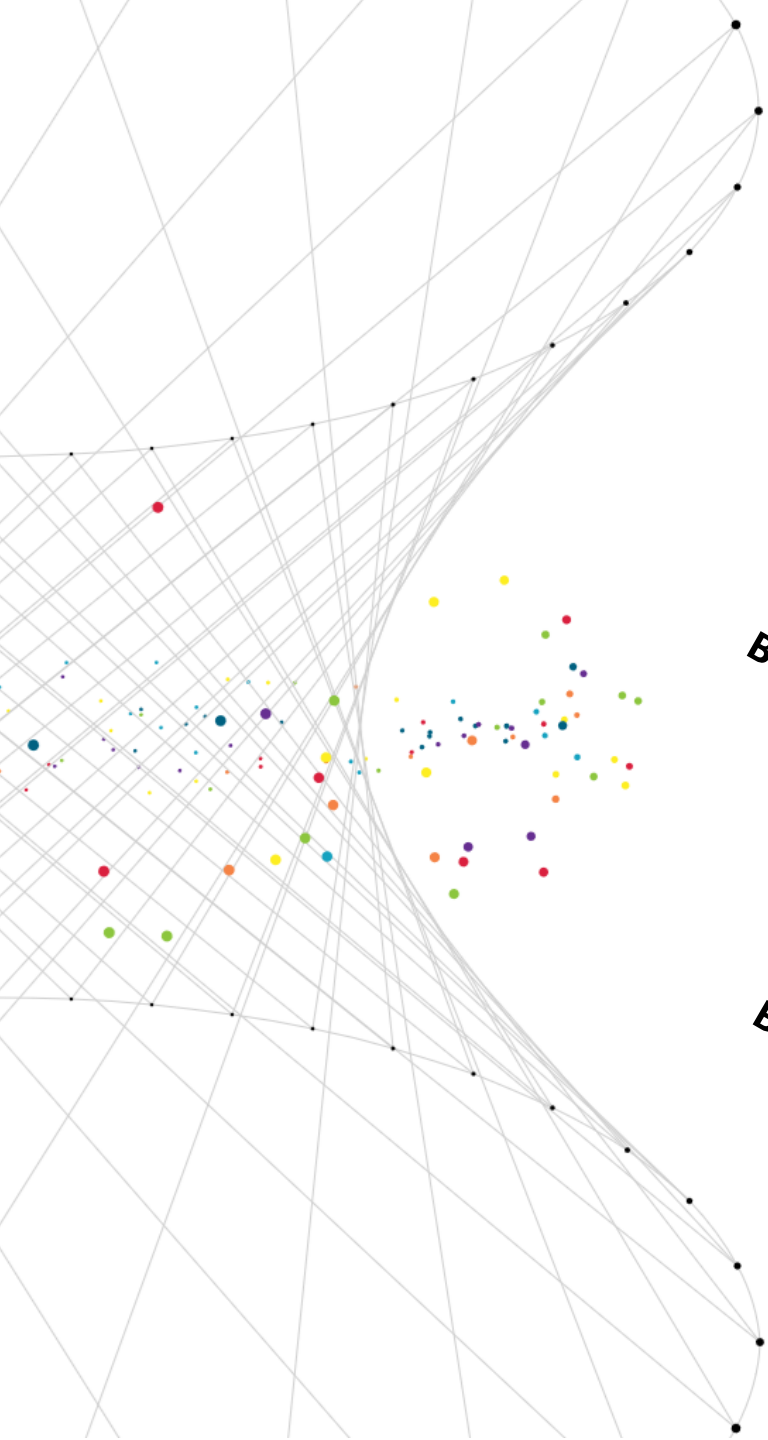
Reliable production

Demand can always be met by the brewery





Short Term Strategy



Expected Shipping Cost*:
\$11.244 million

Short Term: Current Distribution Plan


**Istanbul
Brewery**



**Ankara
Brewery**


Istanbul


Izmir


Antalya


Bursa


Export (Izmir)


Kayseri

103

49

50

25

60

102

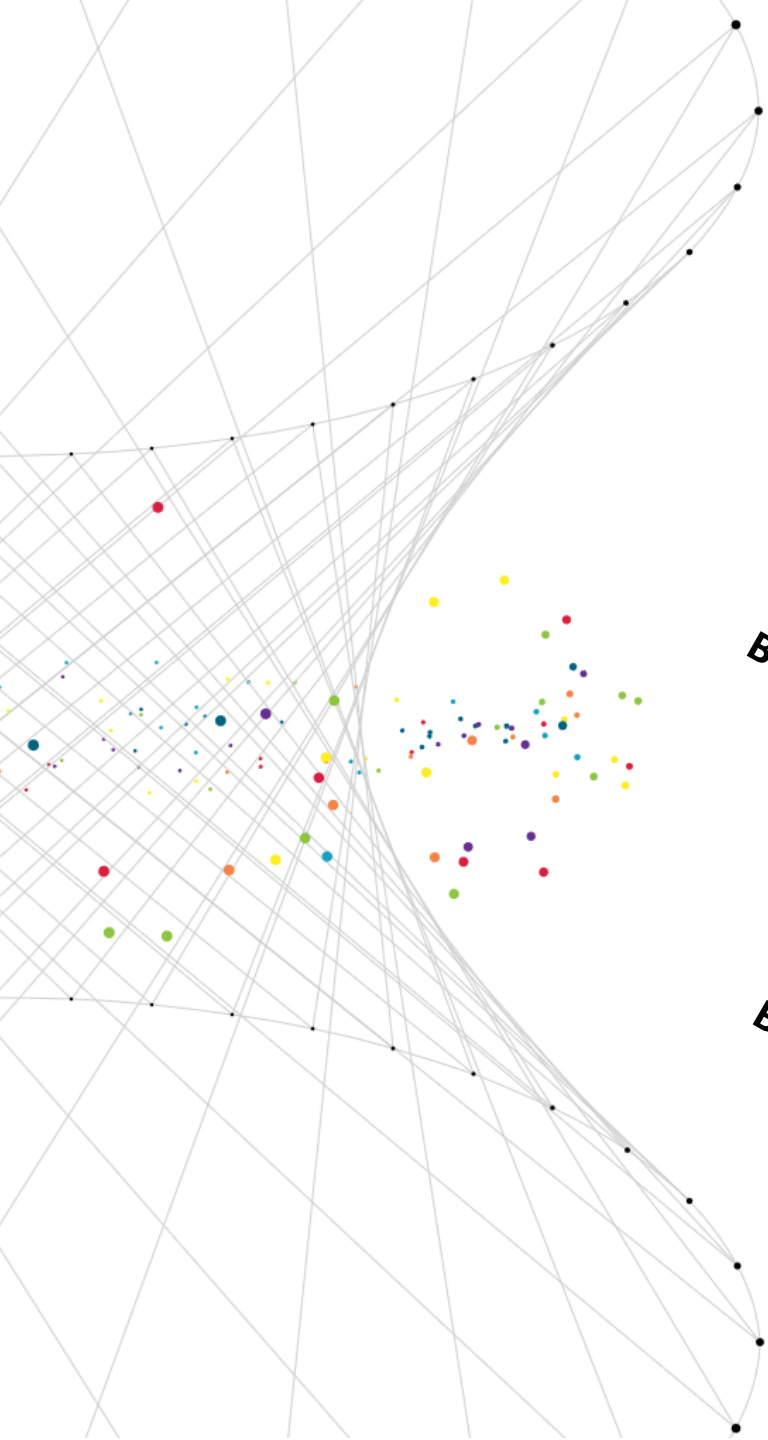
13

Short Term: Improved Distribution Plan

Expected Shipping Cost*:

\$9.936 million

Previous: \$11.244 million



**Istanbul
Brewery**

**Ankara
Brewery**

Istanbul

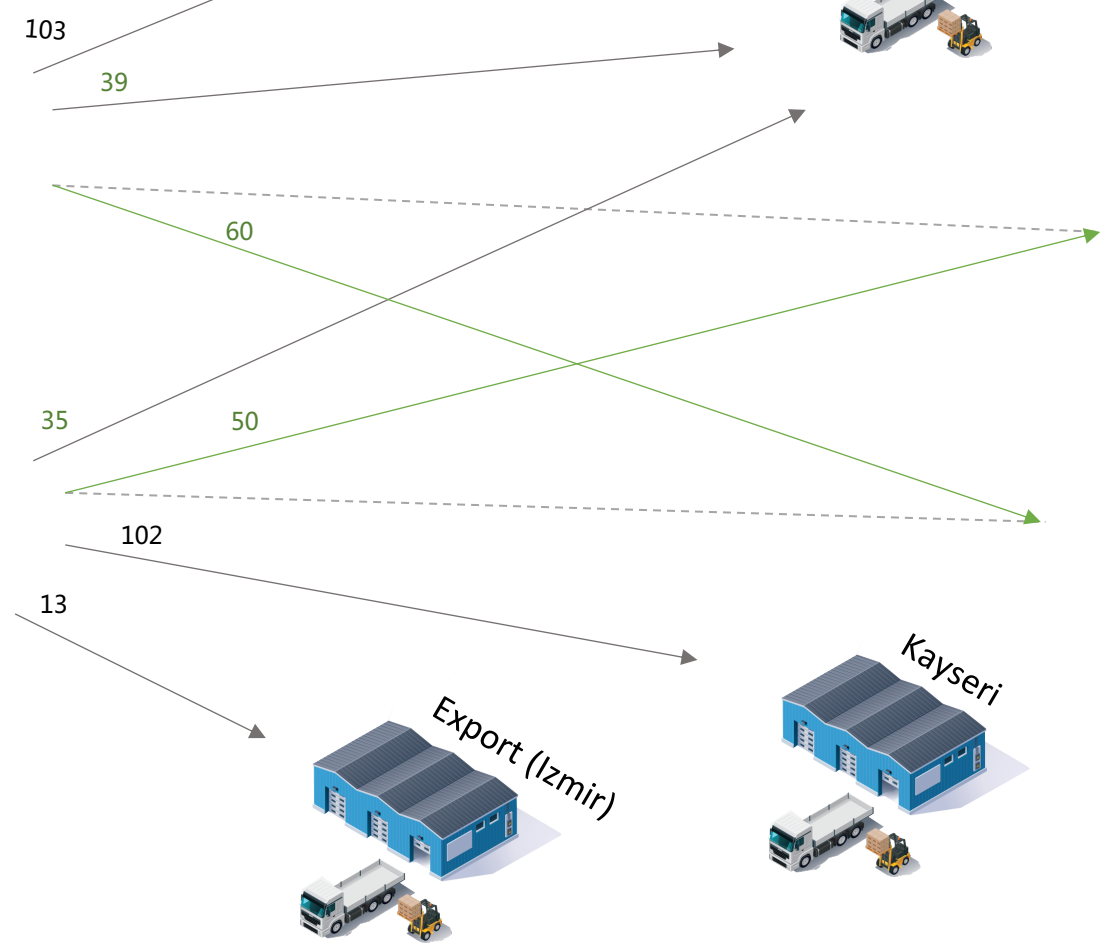
Izmir

Antalya

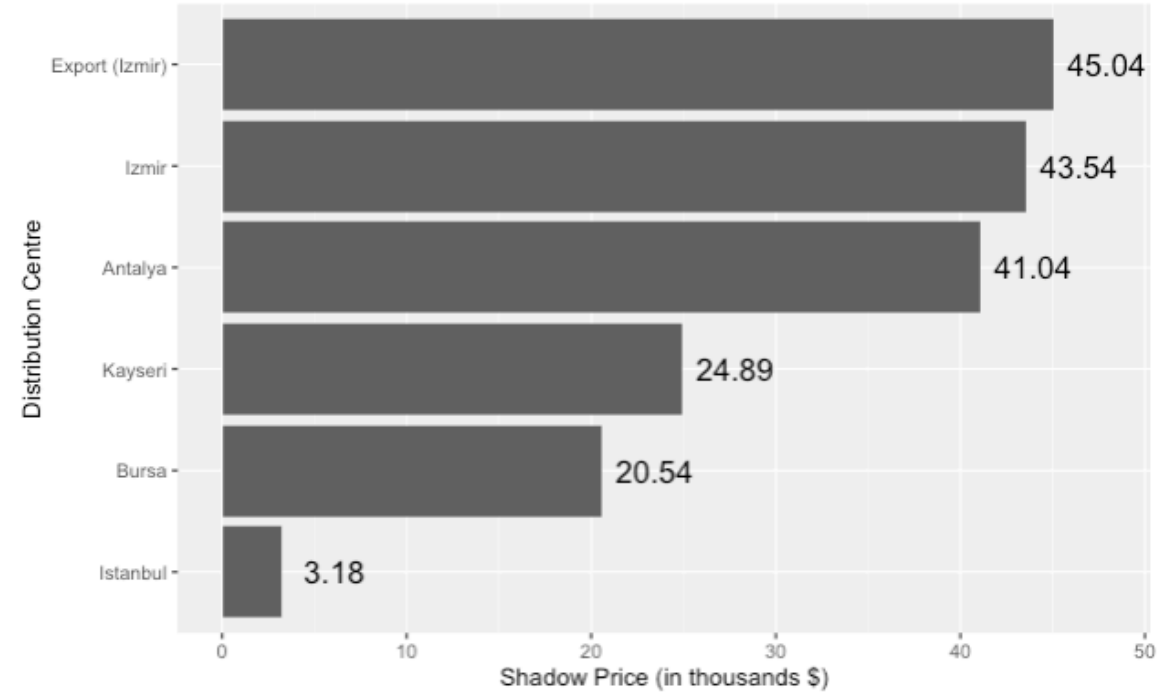
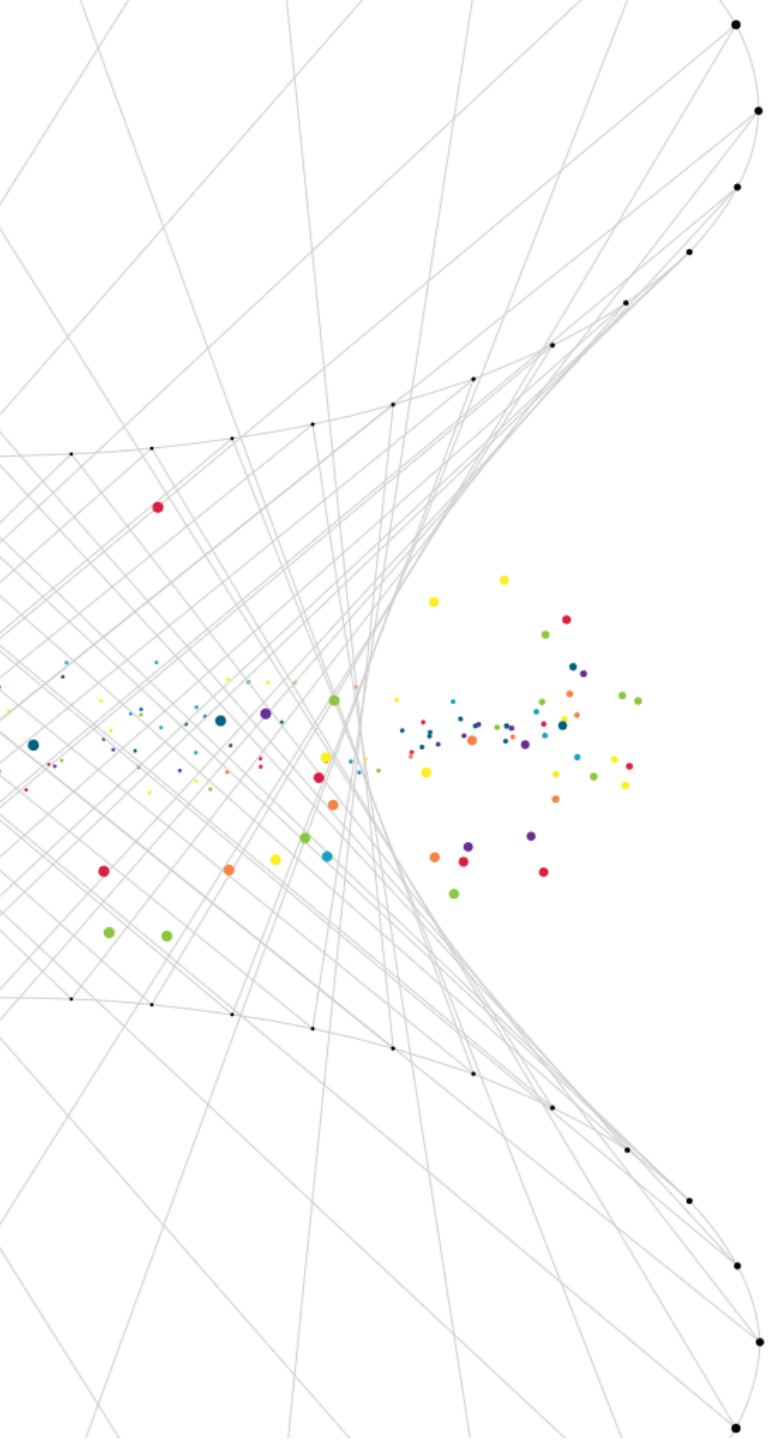
Bursa

Kayseri

Export (Izmir)



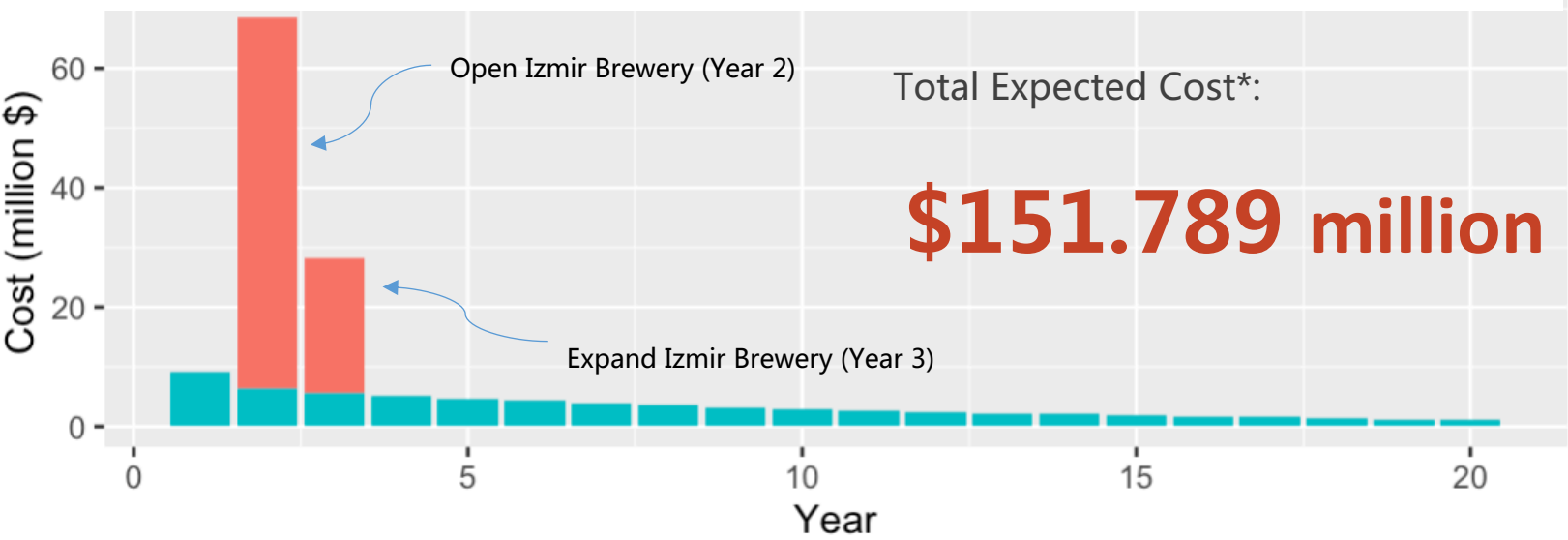
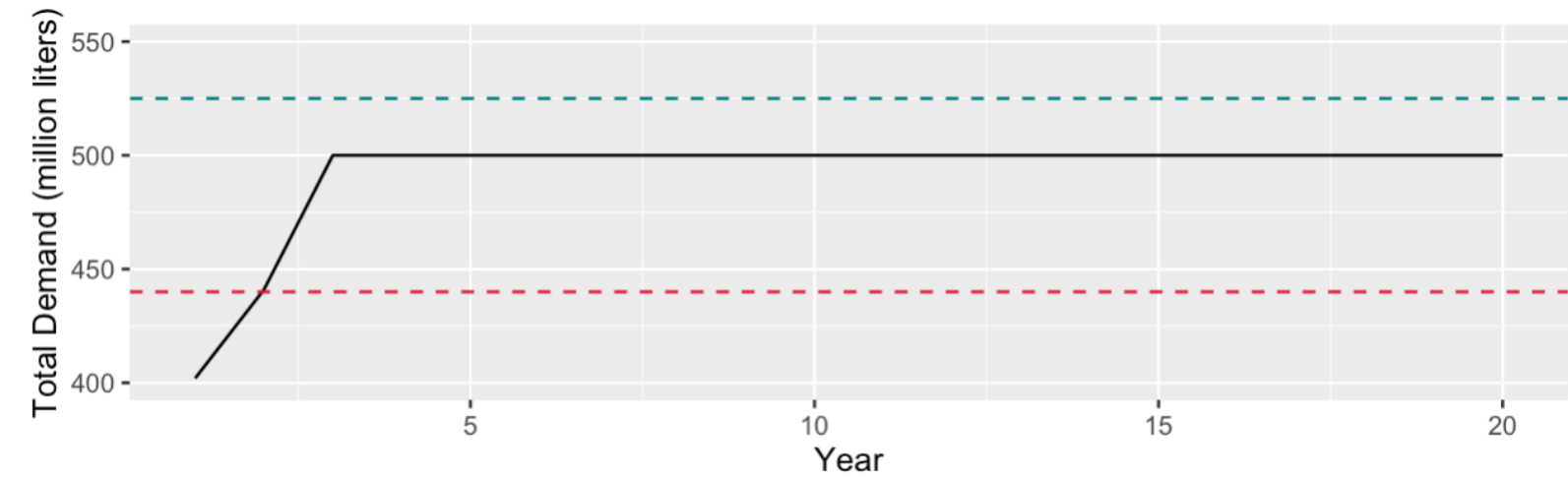
Short Term: Beer demand variation on transportation cost





Long Term Strategy

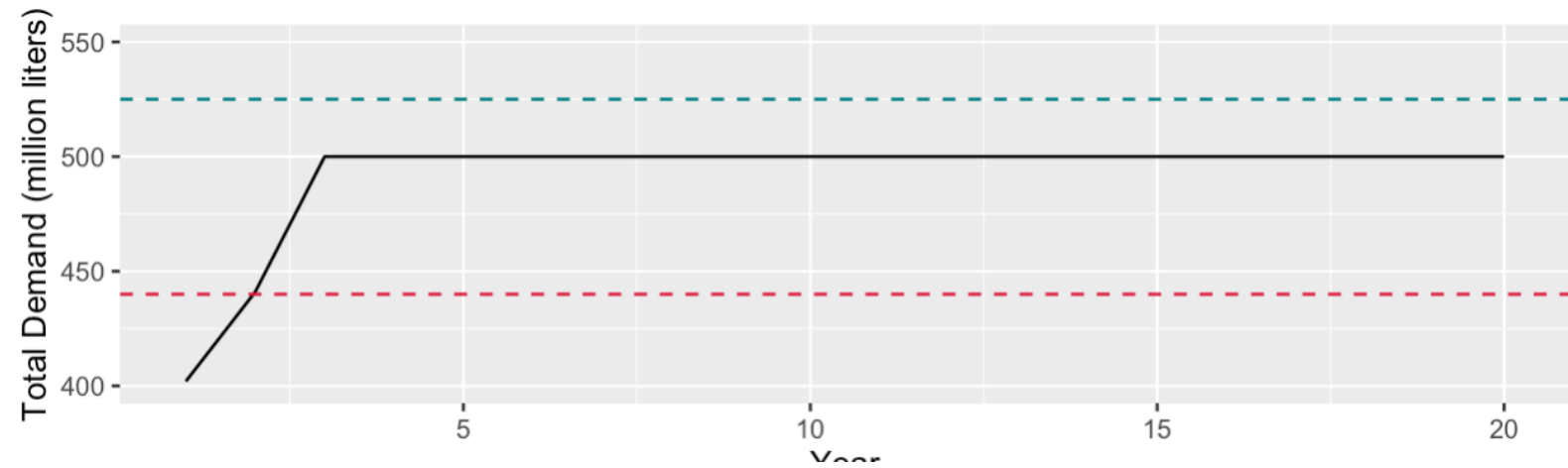
Long Term Solution: Facilities Extension Plan



*Assumed 10% discount rate

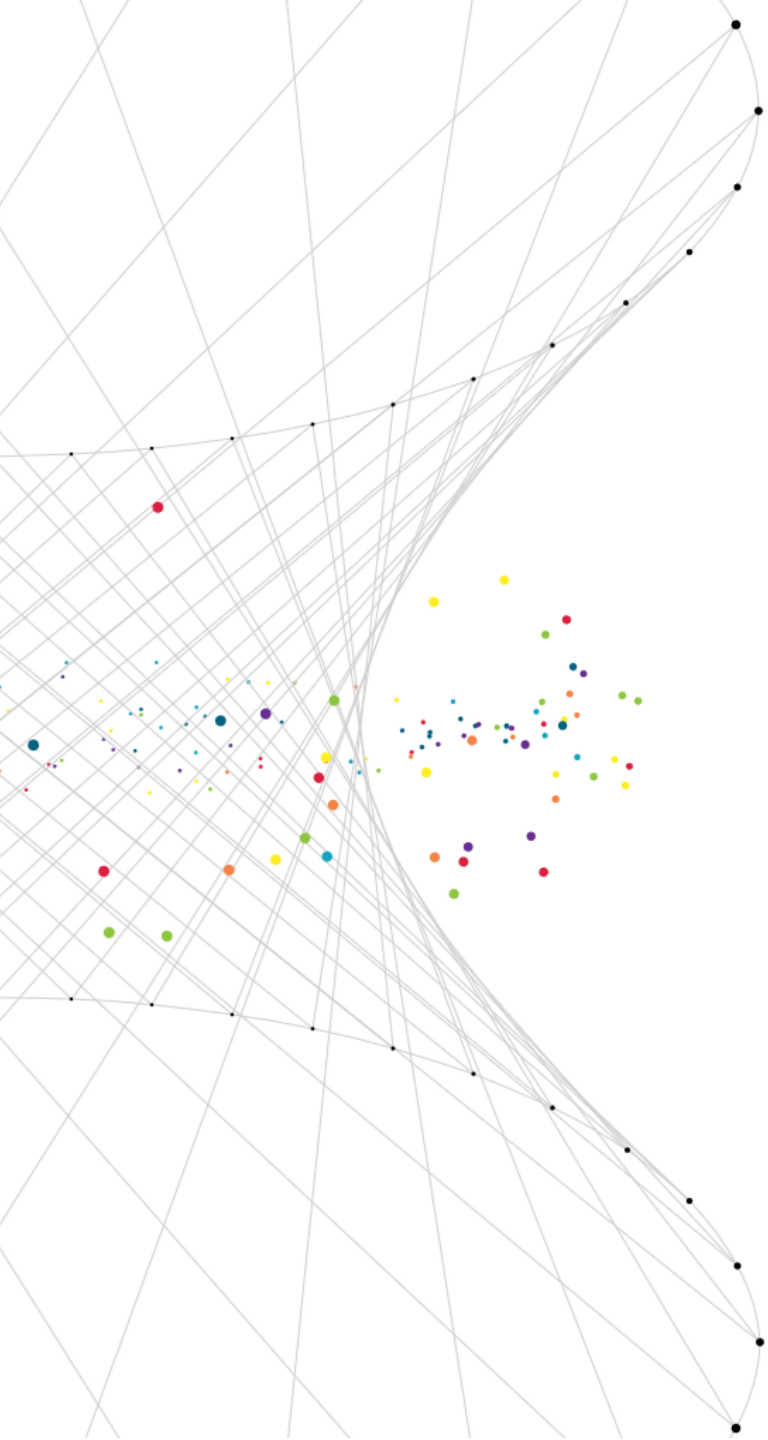


Long Term Solution: Facilities Extension Plan

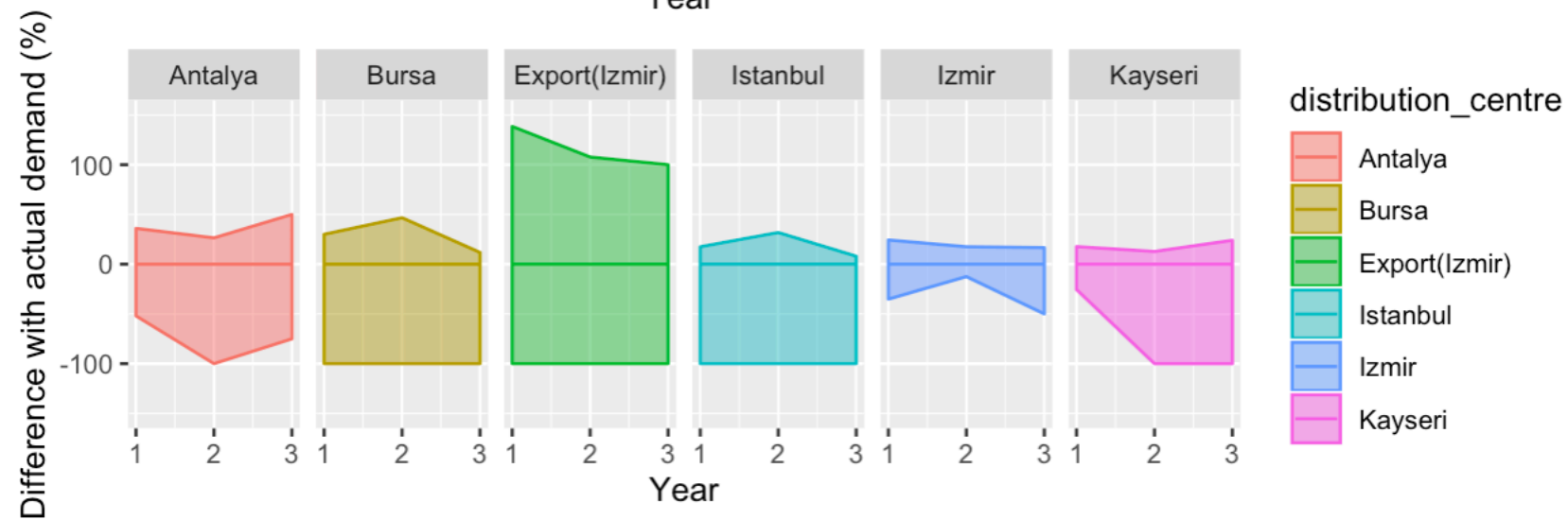
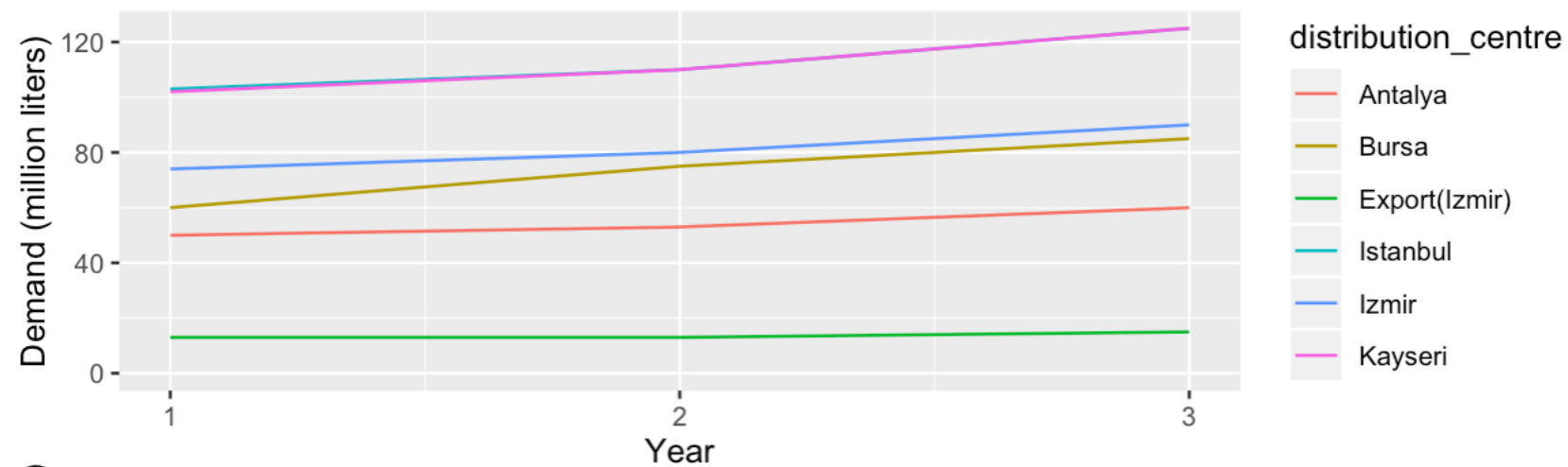


*Assumed 4.18% discount rate





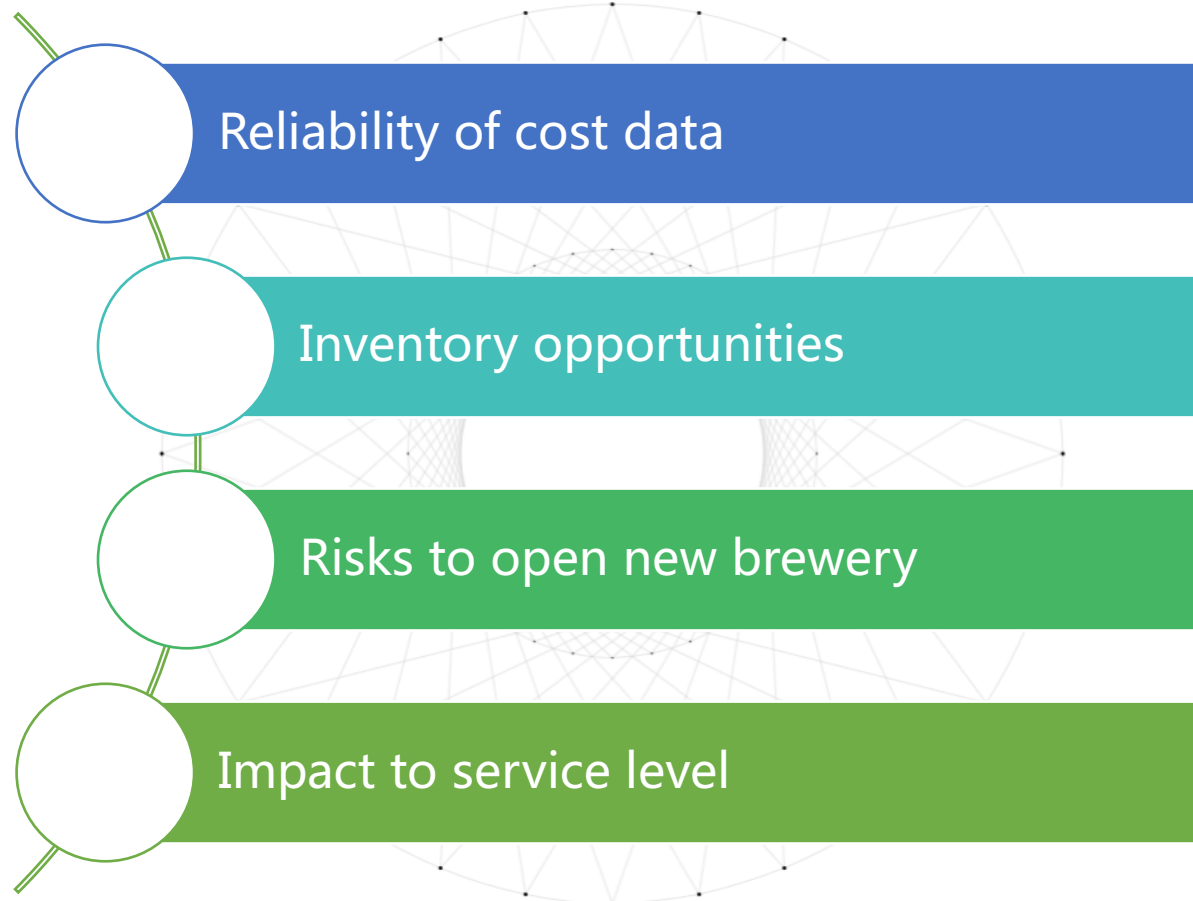
Long Term: Sensitivity of the proposed Solution

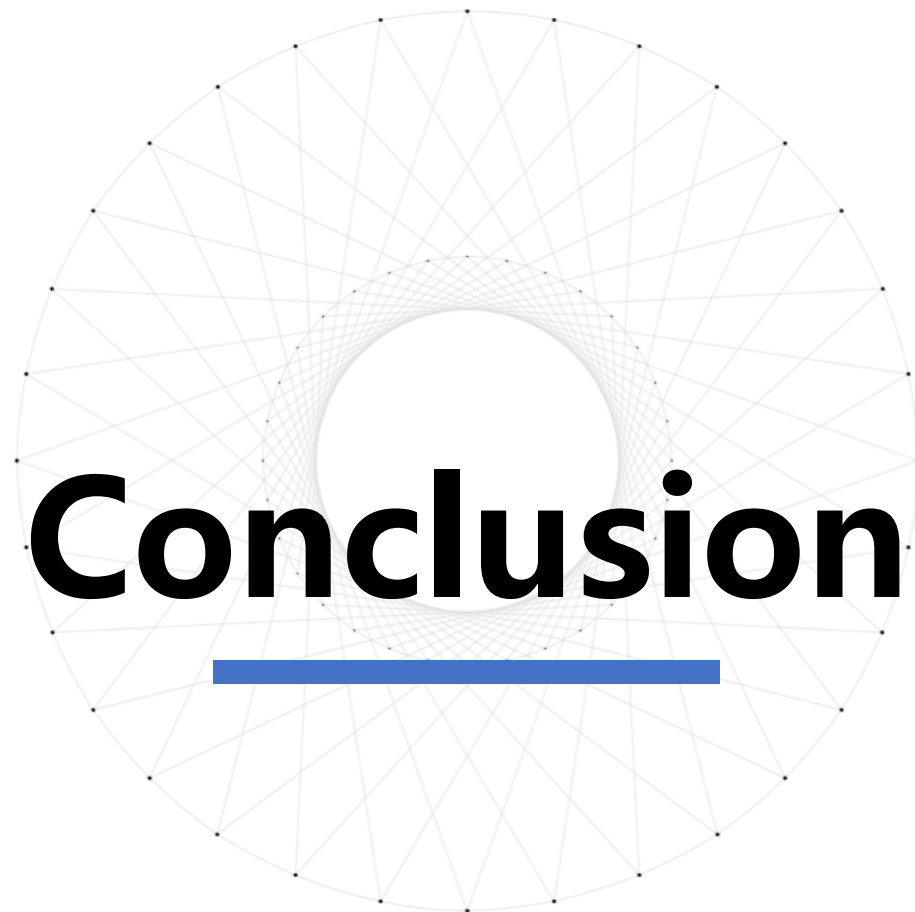




Discussion

Discussion





Conclusion

Conclusion

