



A DISTRIBUTED
CLOUD &
RADIO
PLATFORM FOR
5G NEUTRAL
HOSTS

Technoeconomic analysis of immersive services: The case of 5GCity (Initial results)

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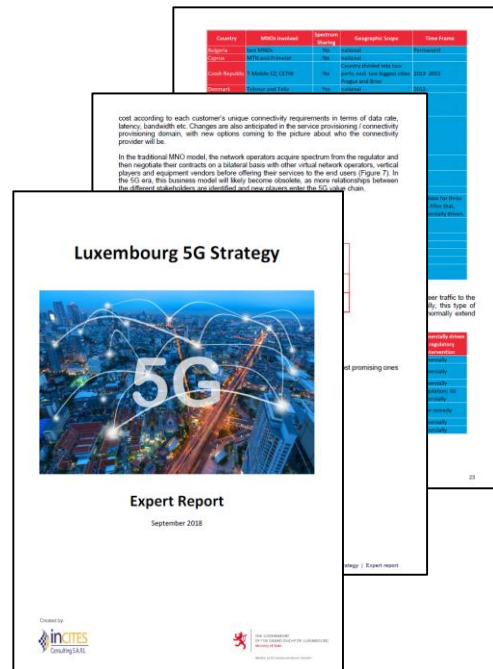
Who we are



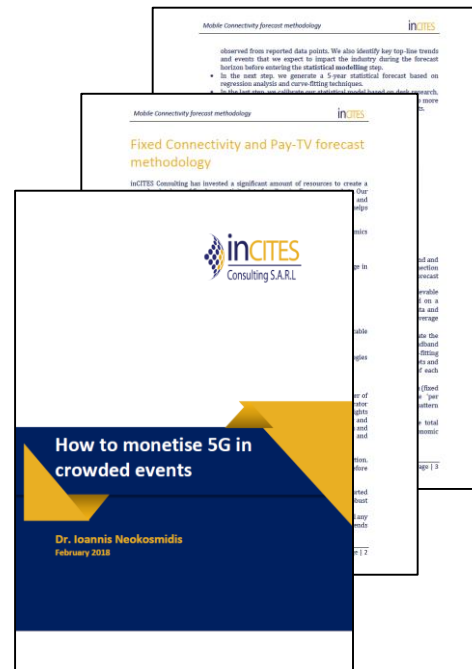
What we do



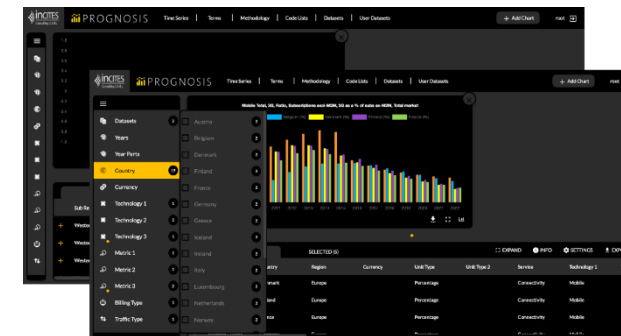
Consulting



Research



Prognosis



5GCity architecture employs distributed cloud technologies to build its combined edge and network infrastructure, providing a multi-tenant, cost effective platform for deploying virtualized, heterogeneous services.

The 5GCity architecture allows the exploitation of the NH model, employing features of the different layers.



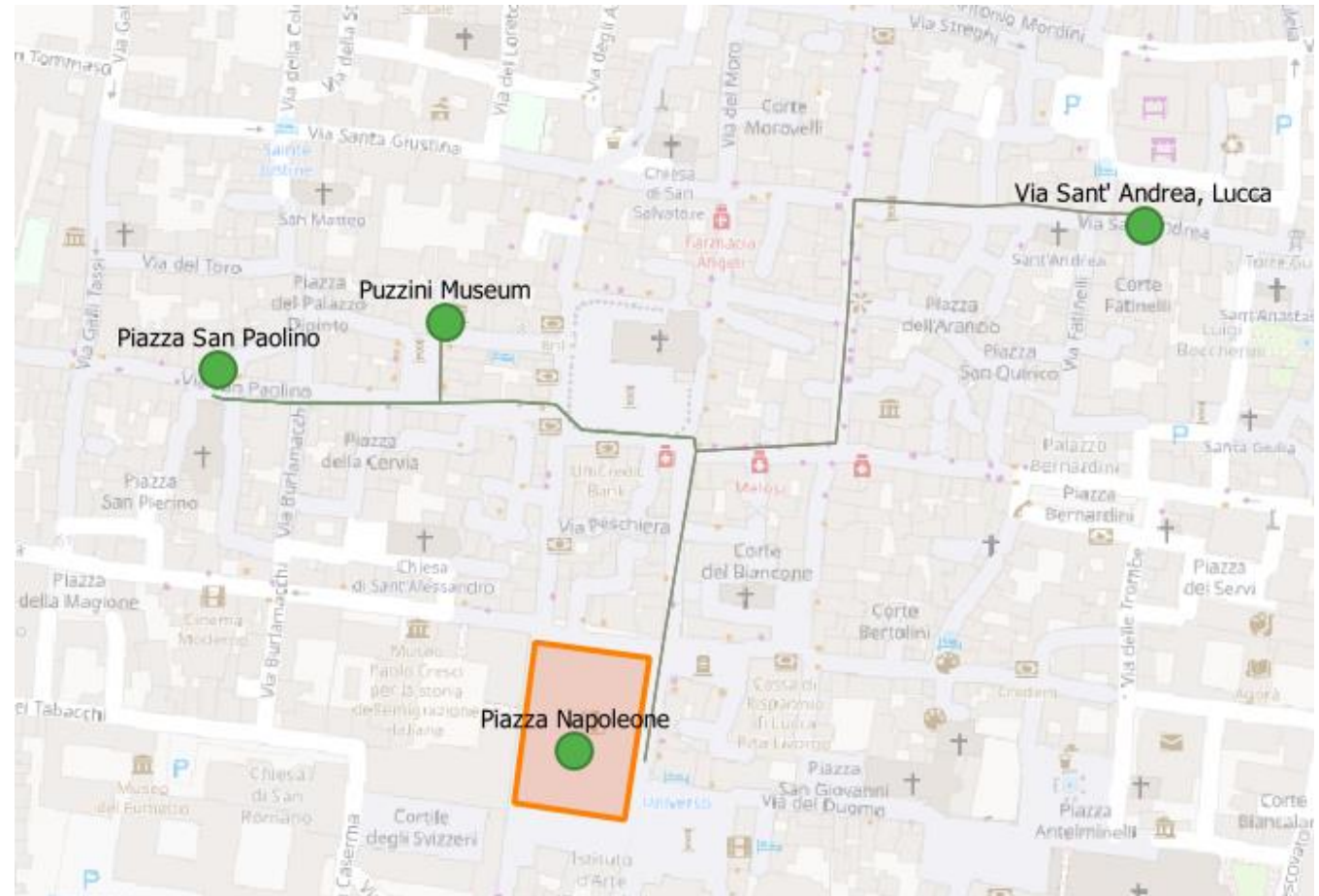
Infrastructure
Dashboard



Services
Dashboard

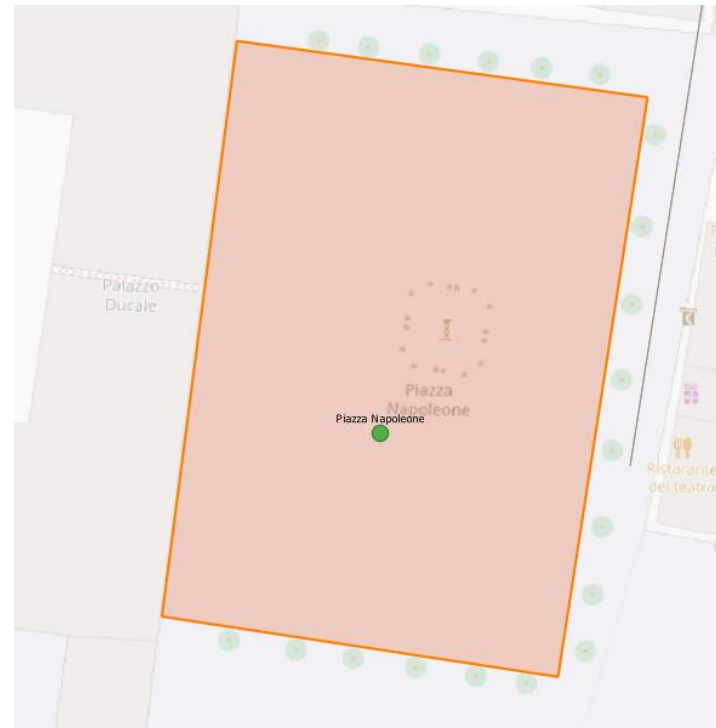
Case Study - Scenario

- **Case Study:** Model a NH providing to MNOs wholesale access to the necessary infrastructure in order to offer immersive video services (UC4)
- **Location:** City of Lucca
 - Piazza Napoleone
 - Puccini Museum
 - Via Sant' Andrea
- **Provided Services:**
 - On demand immersive tour experience using Oculus (Puccini Museum)
 - 360 content live streaming during crowded events (Piazza Napoleone)
 - Street immersive walking / Augmented reality using Hololens (Via Sant' Andrea)



Piazza Napoleone - Characteristics

- **Area:** 4950m² (90m x 55m)
- **Capacity:** 3000 persons
- **Number of events per month:** 4
- **Duration of events:** 3h
- **Number of operators:** 3
 - **MS:** 50%, 30% and 20%
- **Edge node:** Dedicated
- **360 Live Stream rate:** 40Mbps
- **Tariffs:**
 - **Basic connectivity:** 0.5€
 - **360 Live Streaming:** 1.25€



Via Sant' Andrea - Characteristics

- **Number of Hololens devices:** min 5 / max 14
- **Street Length:** 200m
- **Duration of walk:** 30min
- **Size of 3D models:** 70MB
- **Tolerated delay for downloading 3D models:** 5sec
- **Number of “3D models” per SC:** 2
- **Number of operators:** 1
- **Blocking probability:** 1%
- **Edge node:** Dedicated
- **Tariff:** 1.5€



Puccini Museum - Characteristics

- **Number of Oculus devices:** min 5 / max 14
- **Number of rooms:** 9
- **Duration of visit:** 90min
- **Average duration of video:** 5min
- **Video on Demand rate:** 25Mbps
- **Number of “videos” per room:** 1
- **Number of operators:** 1
- **Blocking probability:** 1%
- **Edge node:** Dedicated
- **Tariff:** 2€



Required Components/VMs



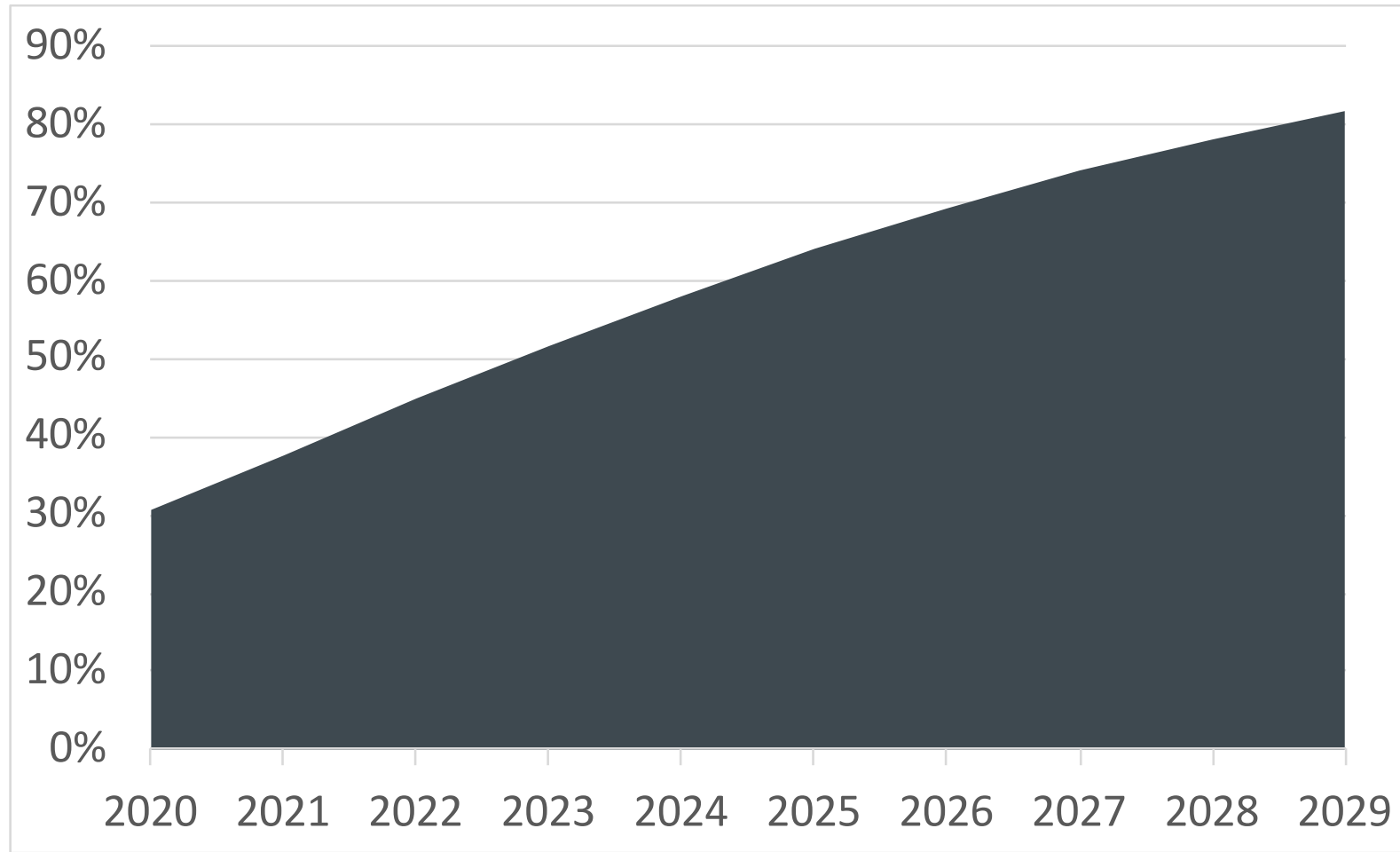
•Data Center

- 5GCity_FE_AAA
- 5GCity_slice_manager
- NFVO_OSM_r5
- NFVO_MTO
- SLA_Manager
- 5GCity_RP
- Infrastructure_Abstraction
- 5GCity_Monitoring
- SDK_5GCatalogue
- VIM_OpenStack Controller
- vFirewall
- vLoadBalancer
- vCache-mid

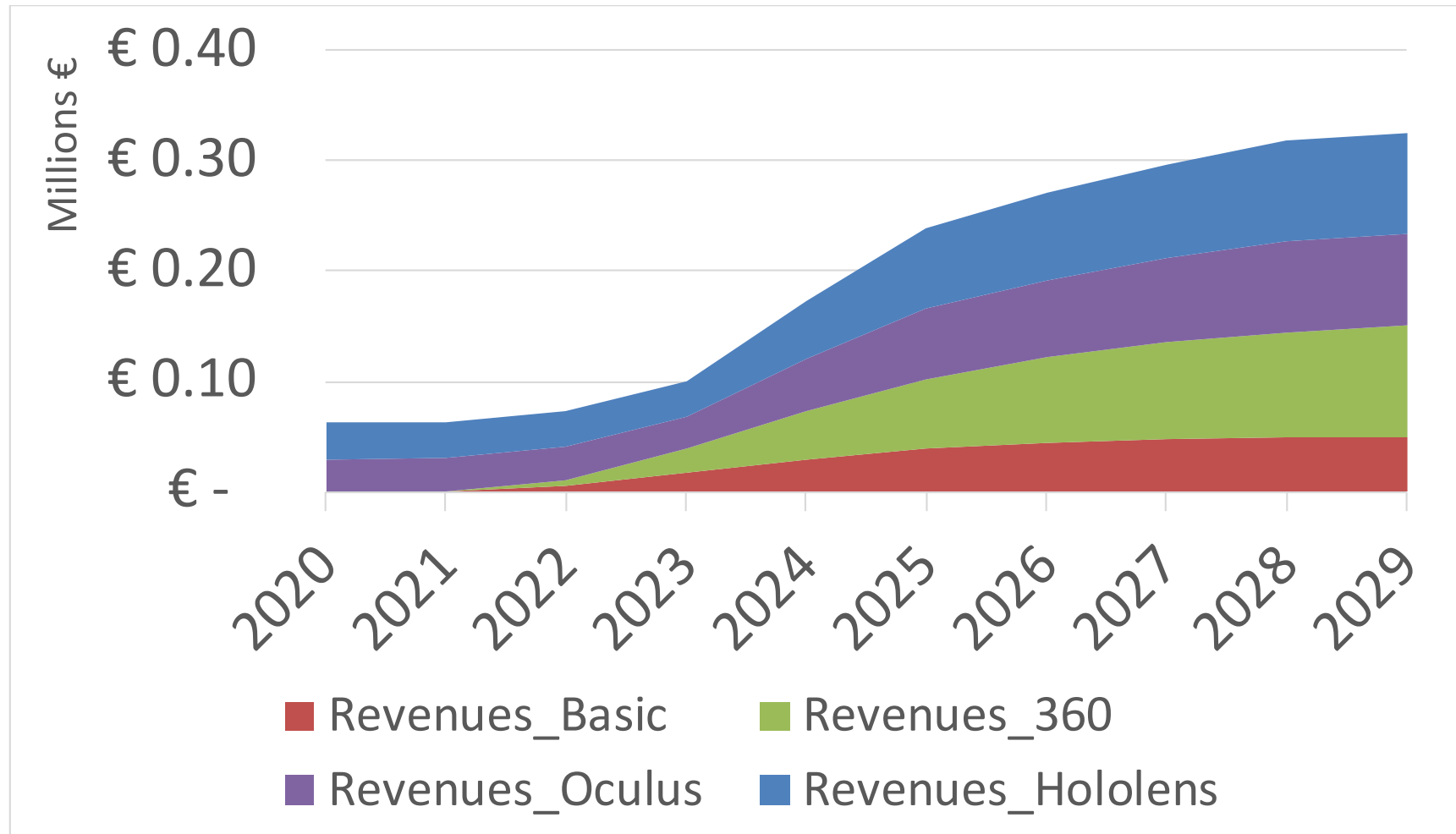
•Edge Cabinet

- ExtEdgeVIM
- EdgeVIM
- Racoon_RAN_Controller
- vCache-edge

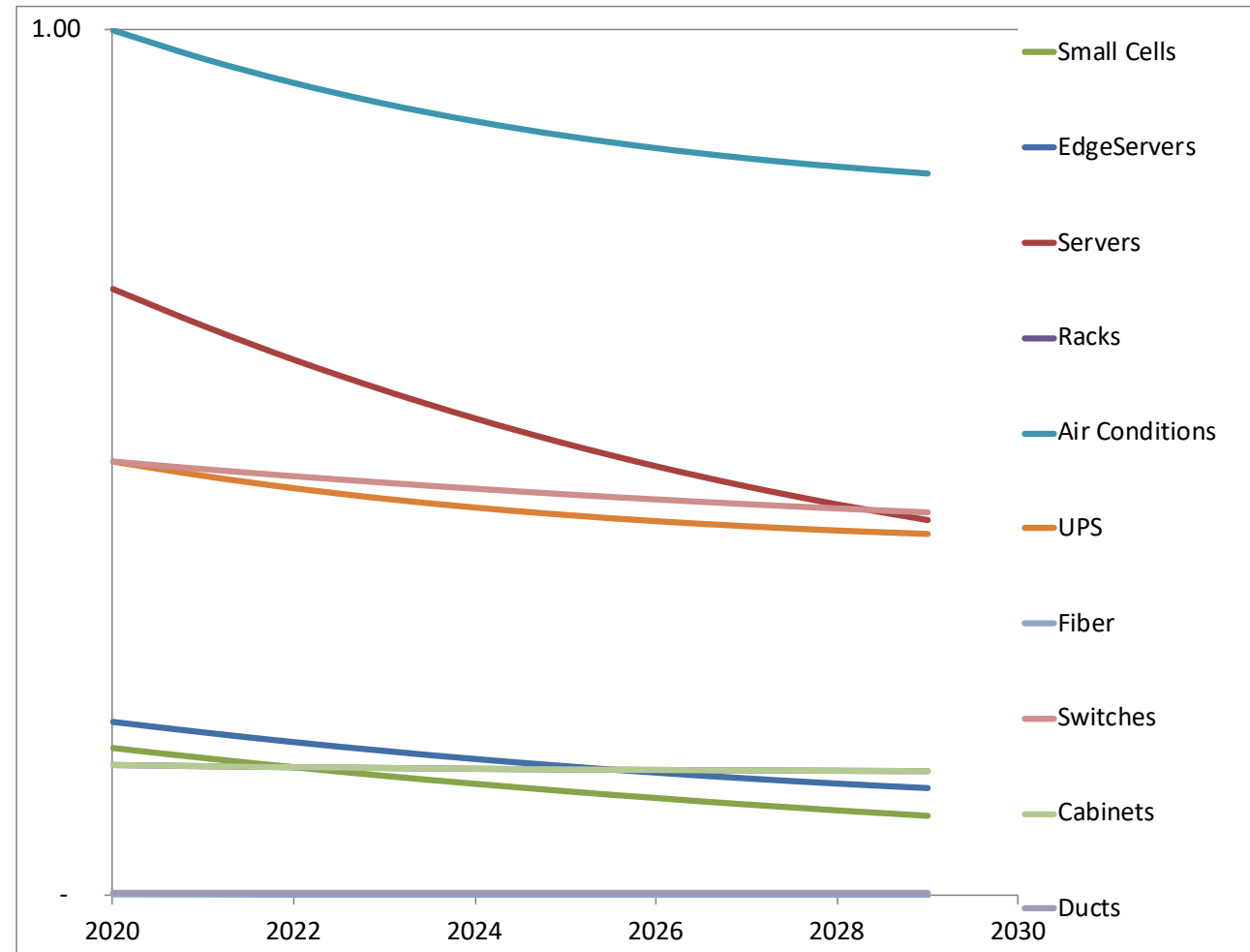
360 Live Streaming Adoption



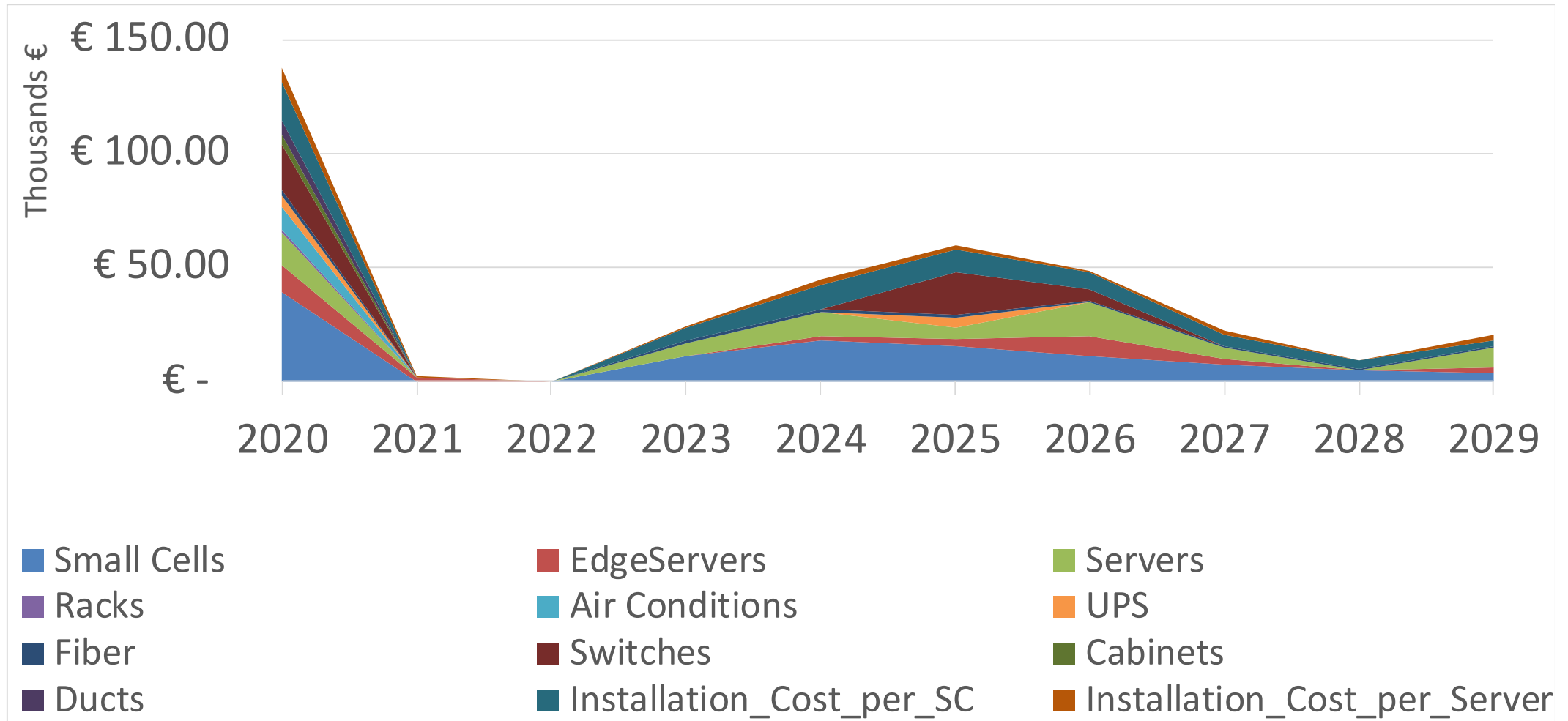
Revenues



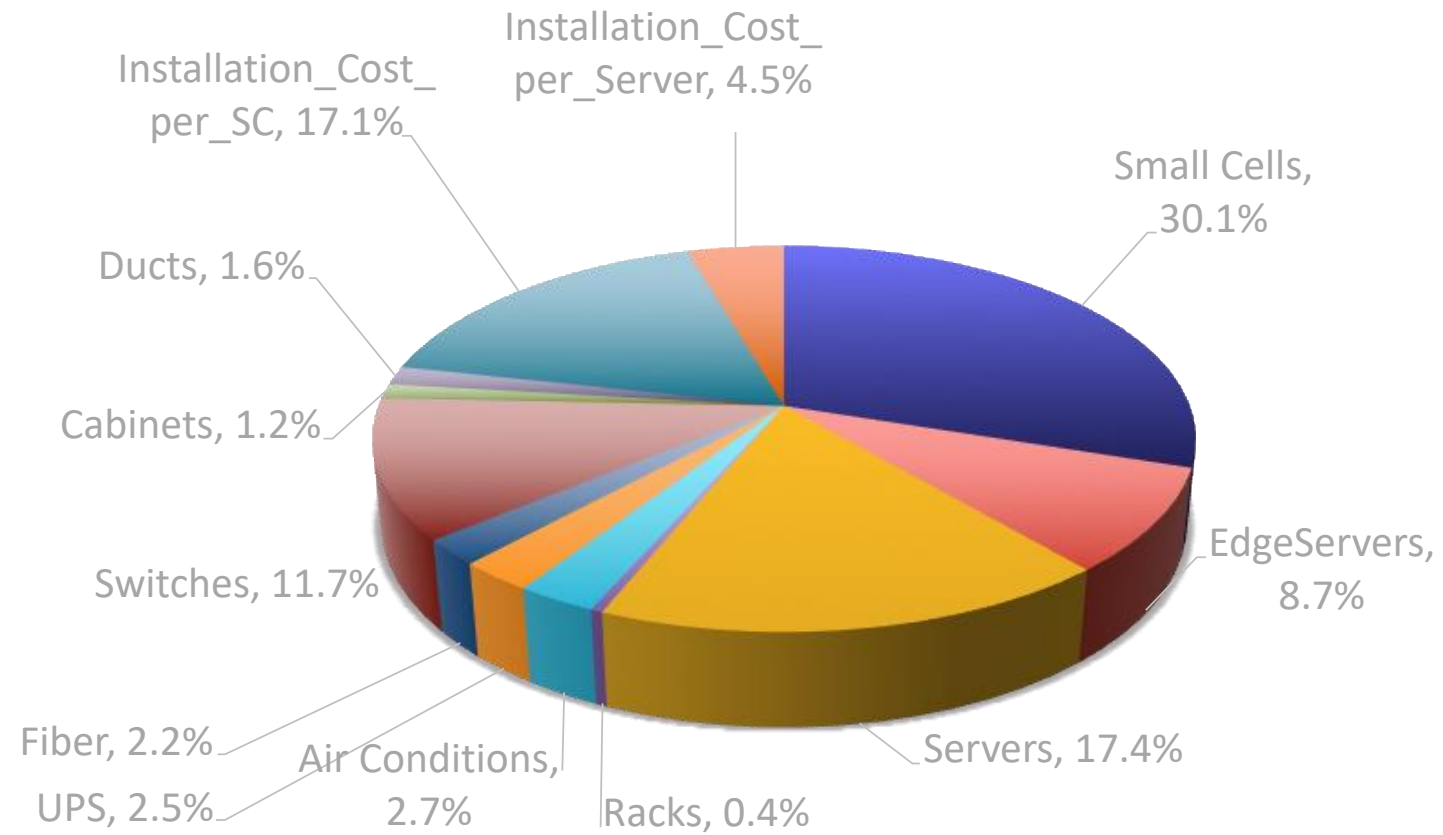
Price Evolution – Learning Curves



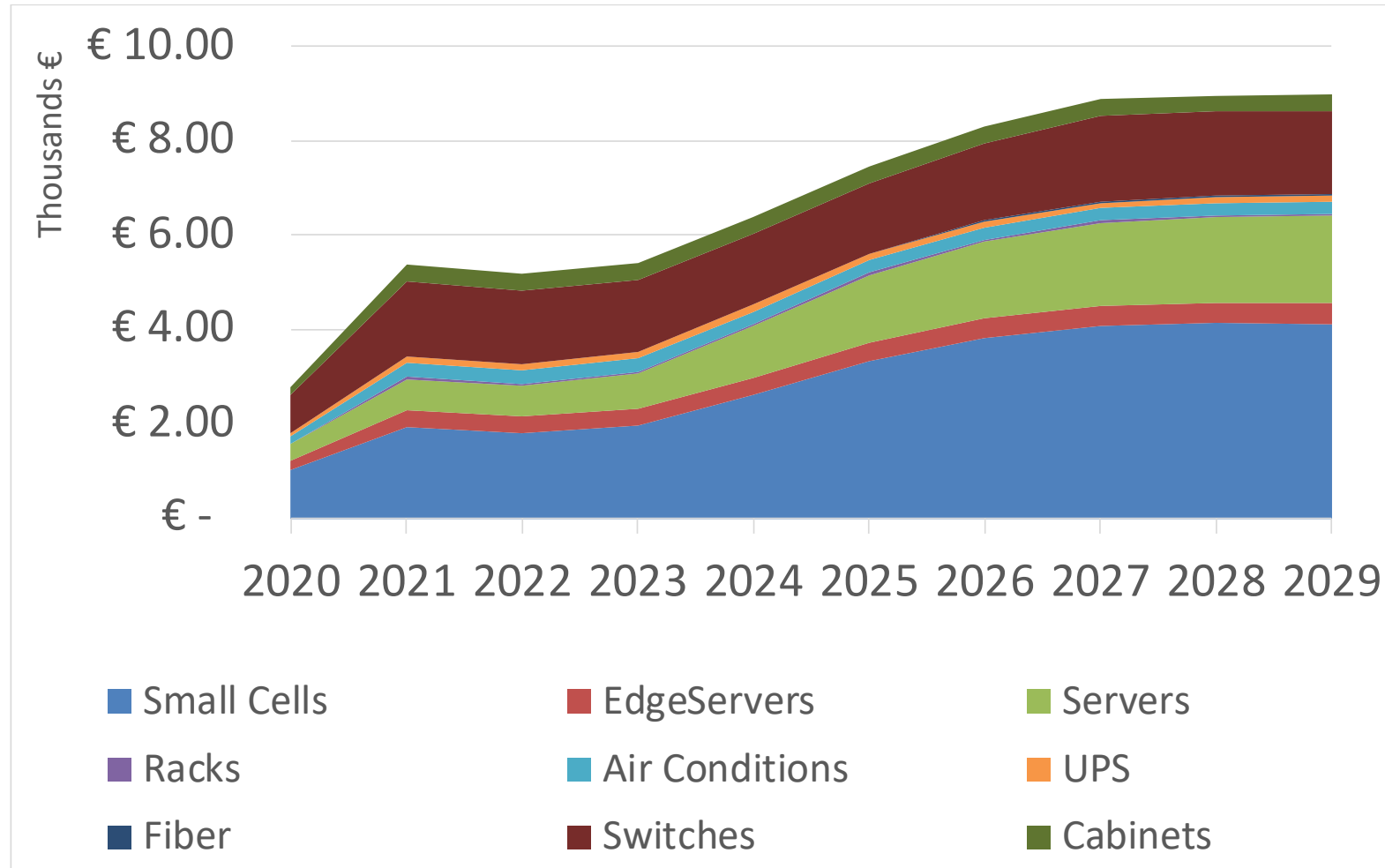
CAPEX



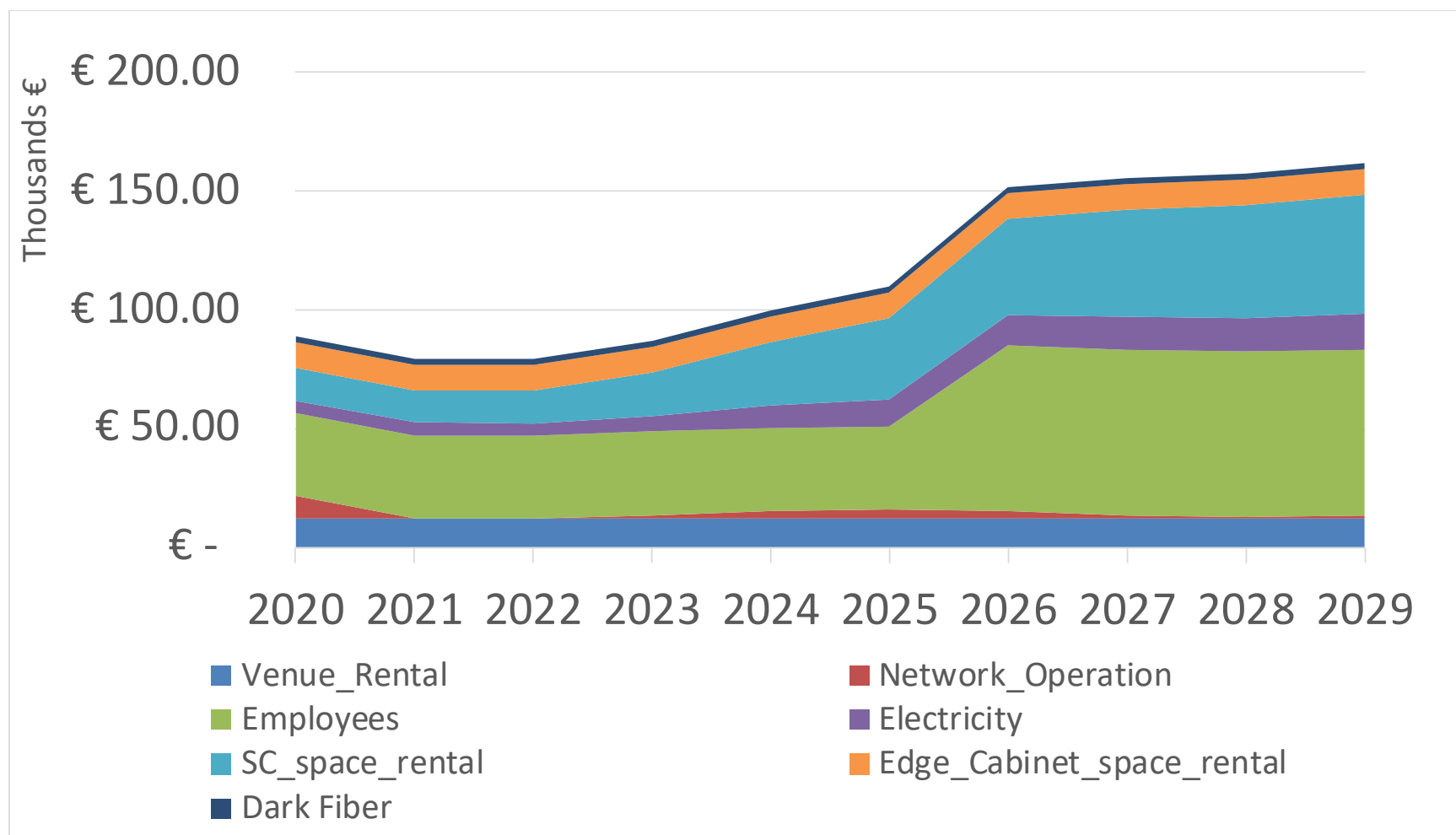
CAPEX



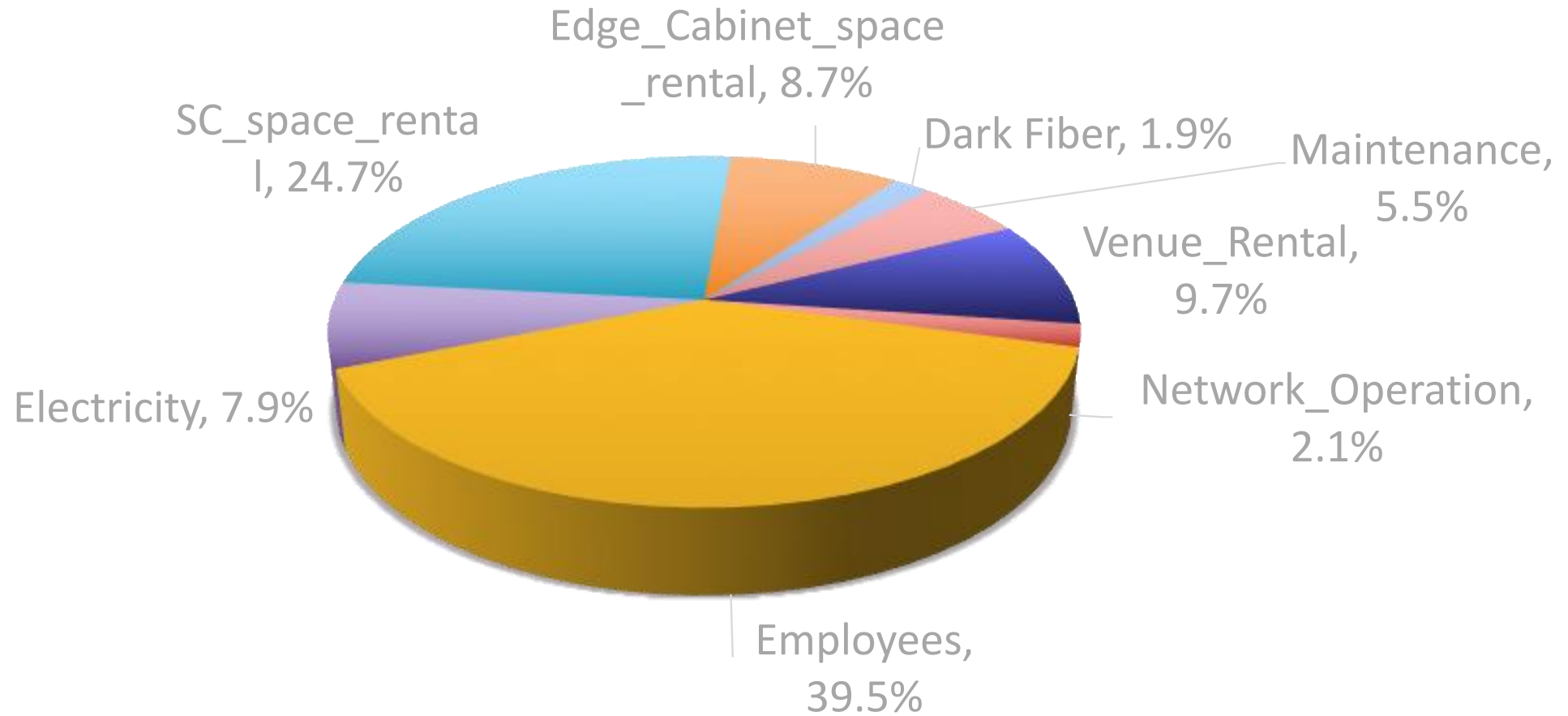
Maintenance



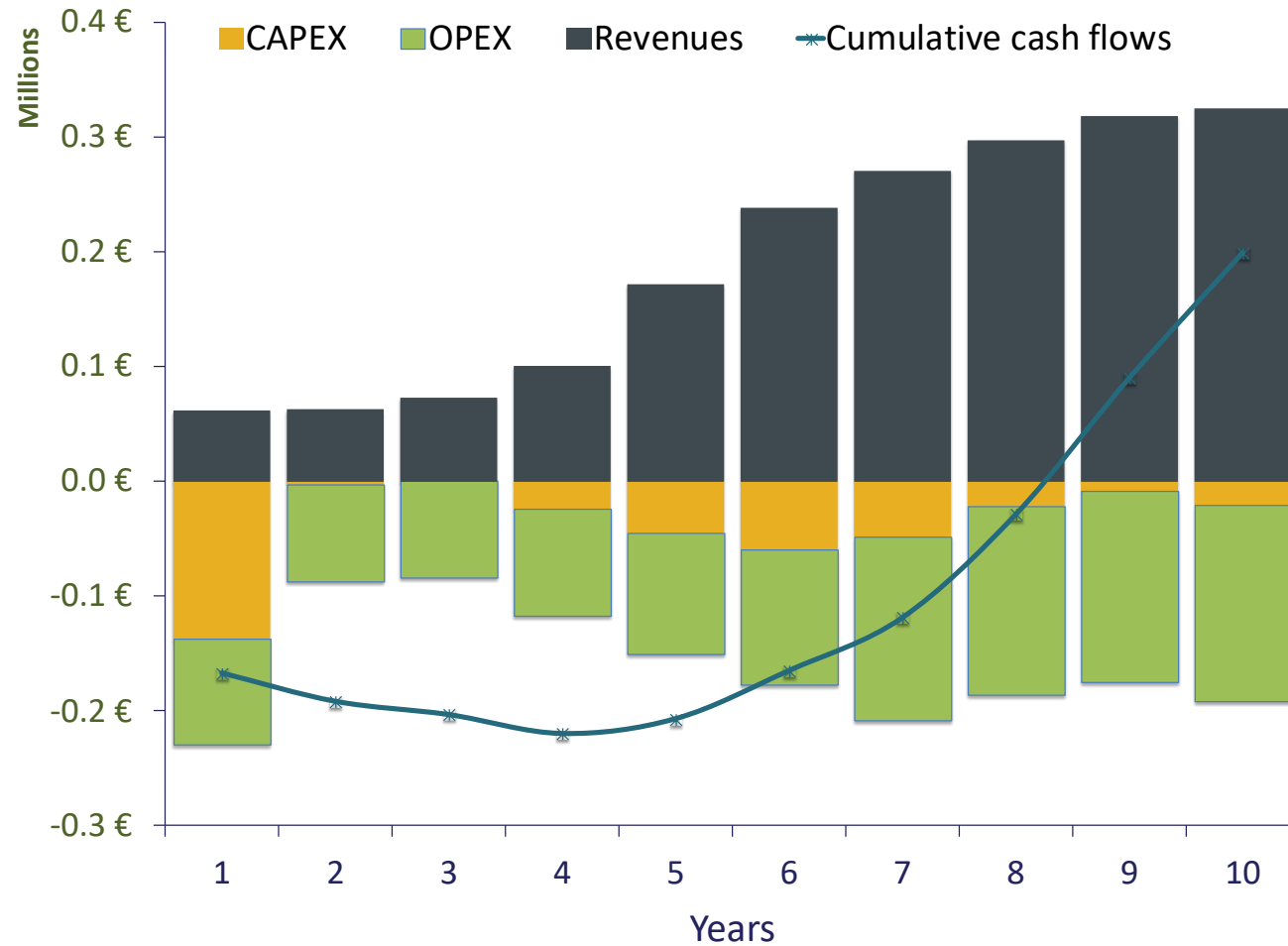
OPEX



OPEX



Results



- **NPV: ~42k€**
- **IRR: 10%**
- **Payback period: ~7years after launch**

Thank you!

