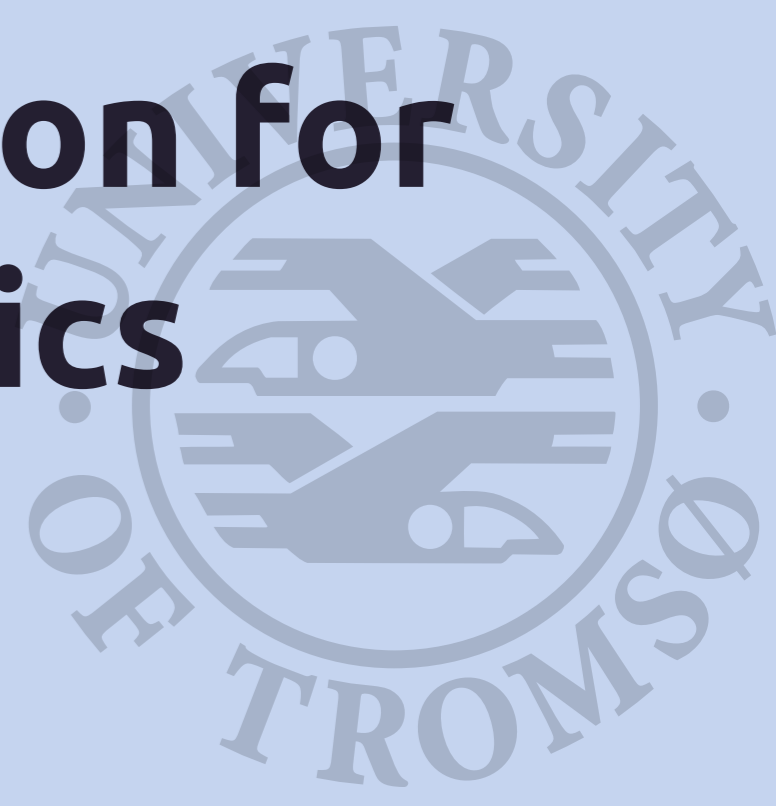# Towards Data Dissemination Policy Prediction for Constrained Environments Using Analytics
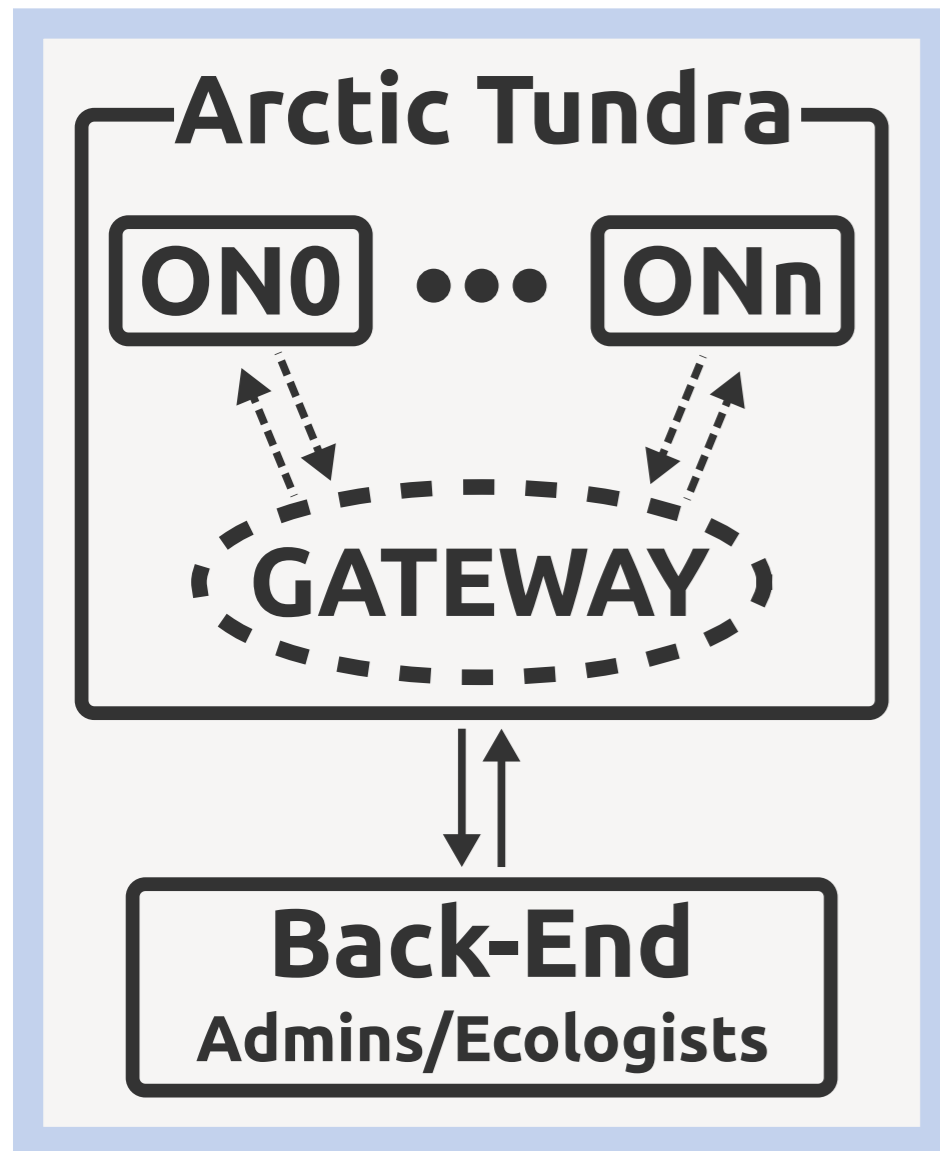
Loic Guegan, Issam Raïs and Otto Anshus

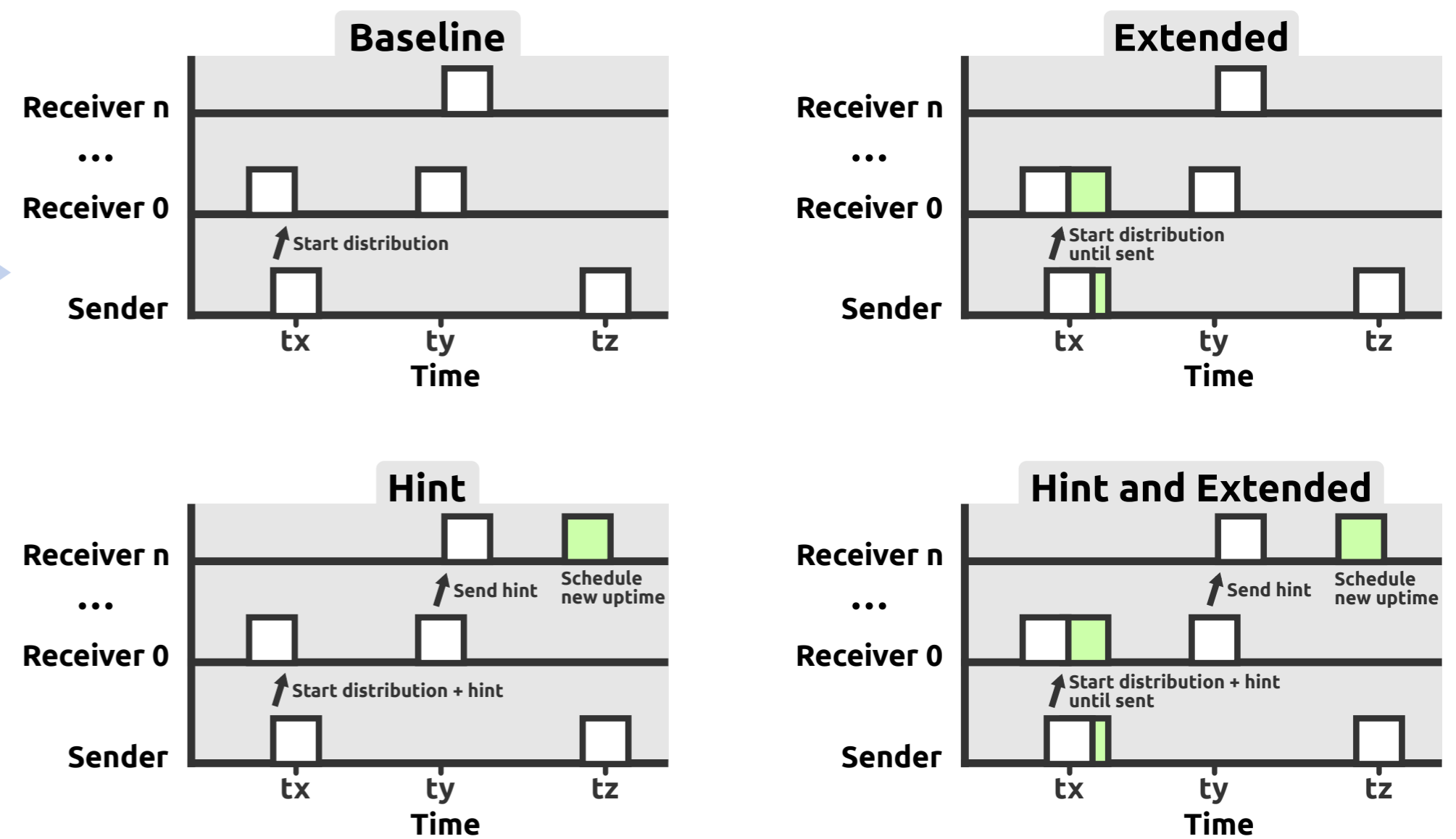UiT, The Arctic University of Norway

✉ loic.guegan@uit.no

How to monitor the Arctic Tundra?

- **Observation Nodes (ON)**
  - Sense the environment
  - Communicate through gateway
- **Gateway**
  - Acts as relay
  - Active when ONs available
- **Back-End**
  - Interface to the infrastructure
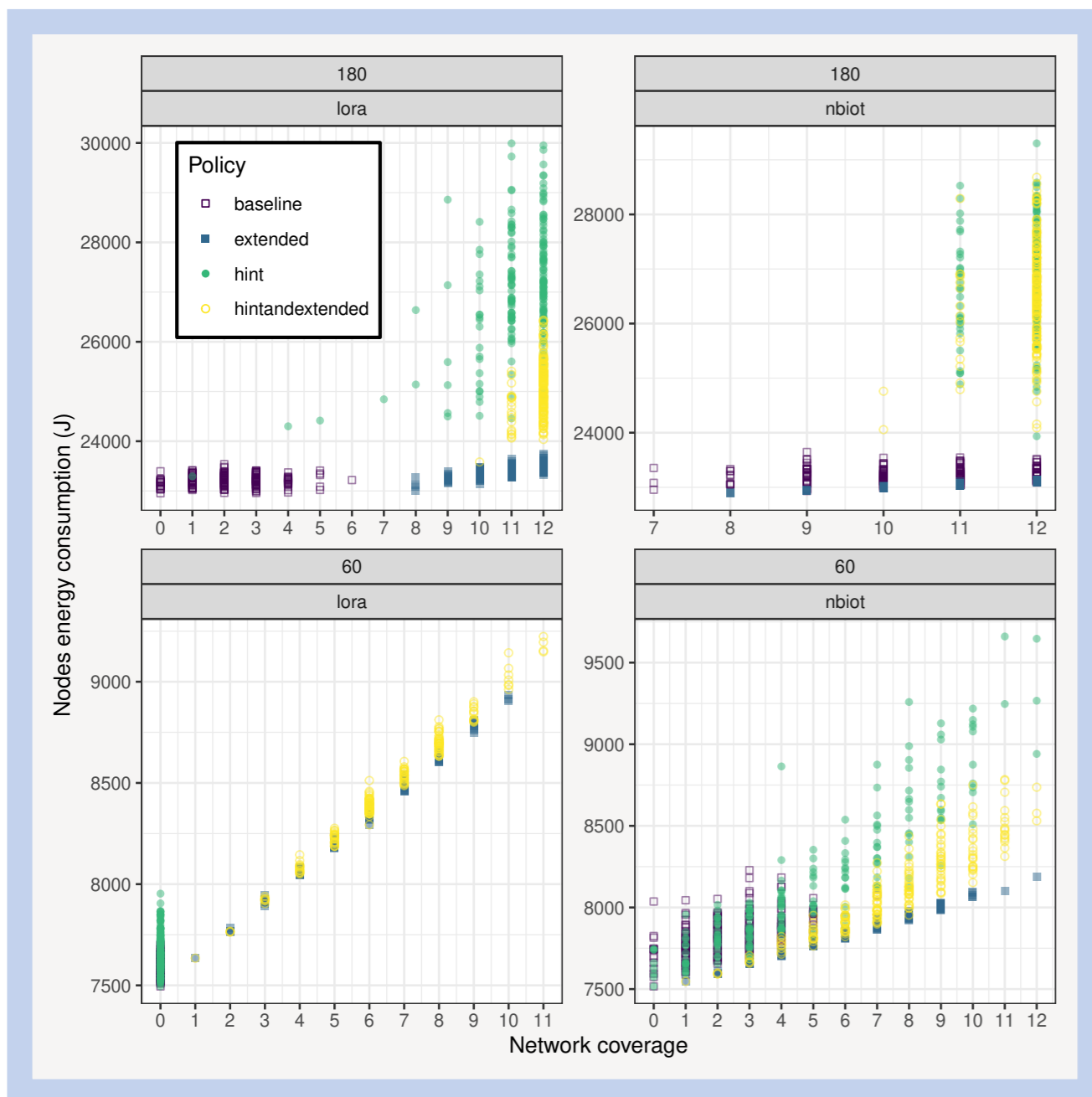 - Receive/Transmit updates

How to disseminate data?

- **Dissemination policies proposed in [1]**

How to choose a dissemination policy?
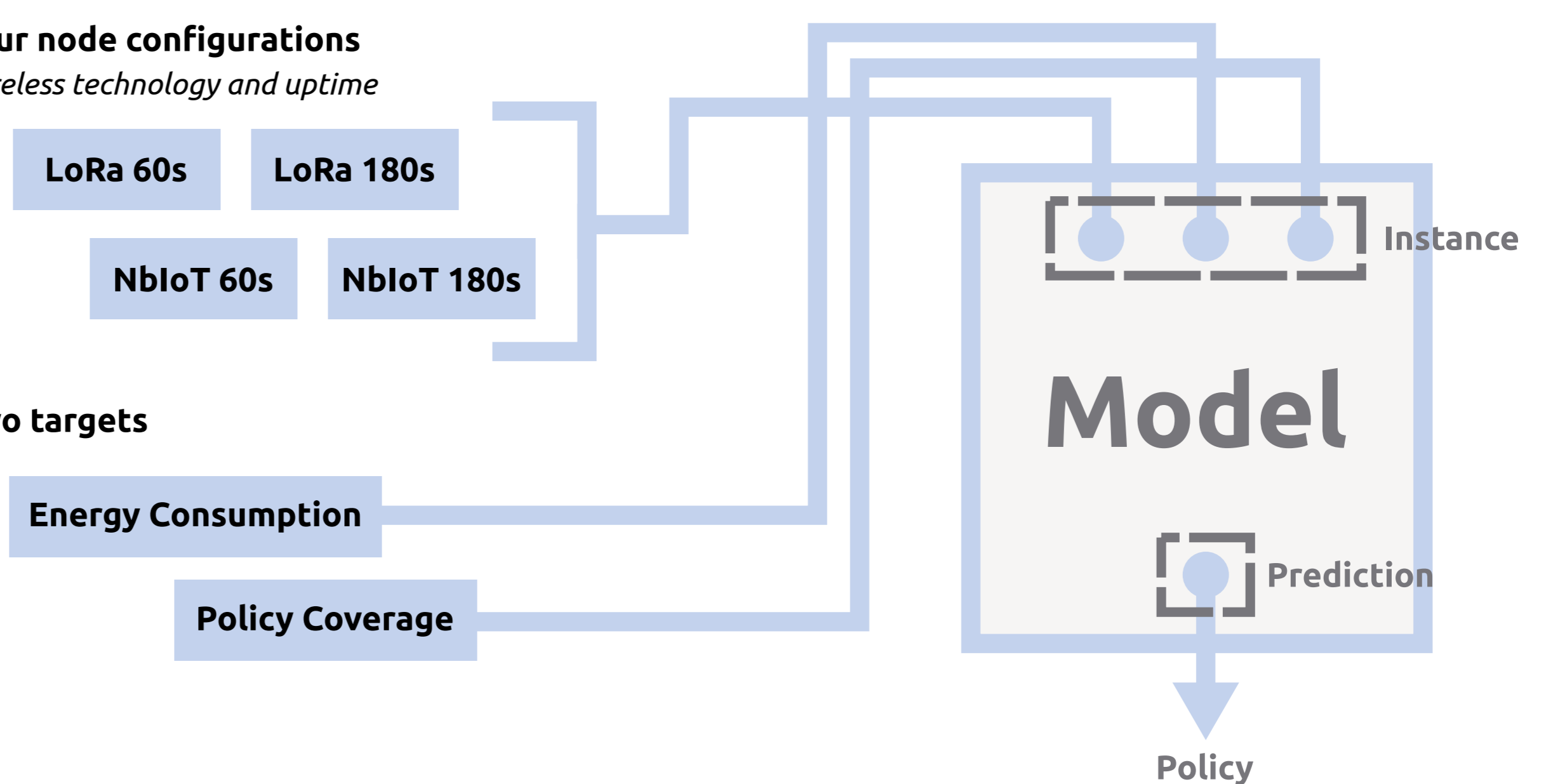
Results From [1]

Model Features

1. **Four node configurations**
   Wireless technology and uptime

   - LoRa 60s
   - LoRa 180s
   - NbIoT 60s
   - NbIoT 180s

2. **Two targets**
   - Energy Consumption
   - Policy Coverage

Classification Models and Supervised Learning

Early investigations

Experimental Protocol

- **Two models**
  - K-Nearest Neighbors
  - Classification and Regression Tree (CART)

- **One dataset from previous experiments [1]**

- **Two evaluation metrics**
  - Overall Accuracy (OAcc)
  - F1-Score

	F1-Score and accuracy of KNN and DT (no *Hint*)				
	F1-Score				
Model	*Baseline*	*Hint*	*Extended*	*Hint+Extended*	**OAcc**
KNN	0.88	NA	0.89	0.91	0.81
DT	0.93	NA	0.86	0.92	0.83

[1] I. Rais, L. Guegan, and O. Anshus, "Impact of loosely coupled data dissemination policies for resource challenged environments" In 2022 22nd IEEE International Symposium on Cluster, Cloud and Internet Computing (CCGrid)