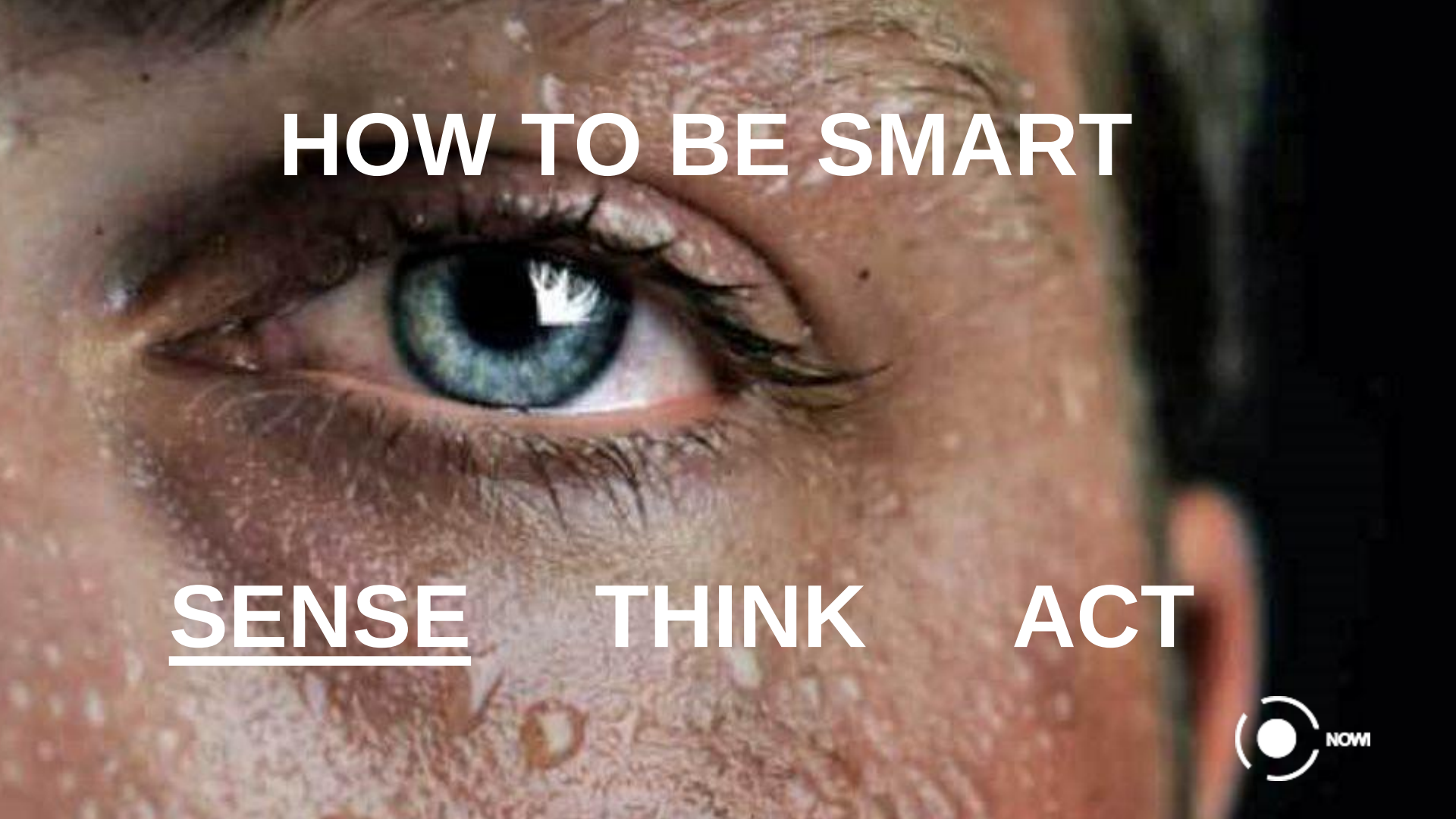
NOWI : Enabling the Internet of Things

65th SASG meeting

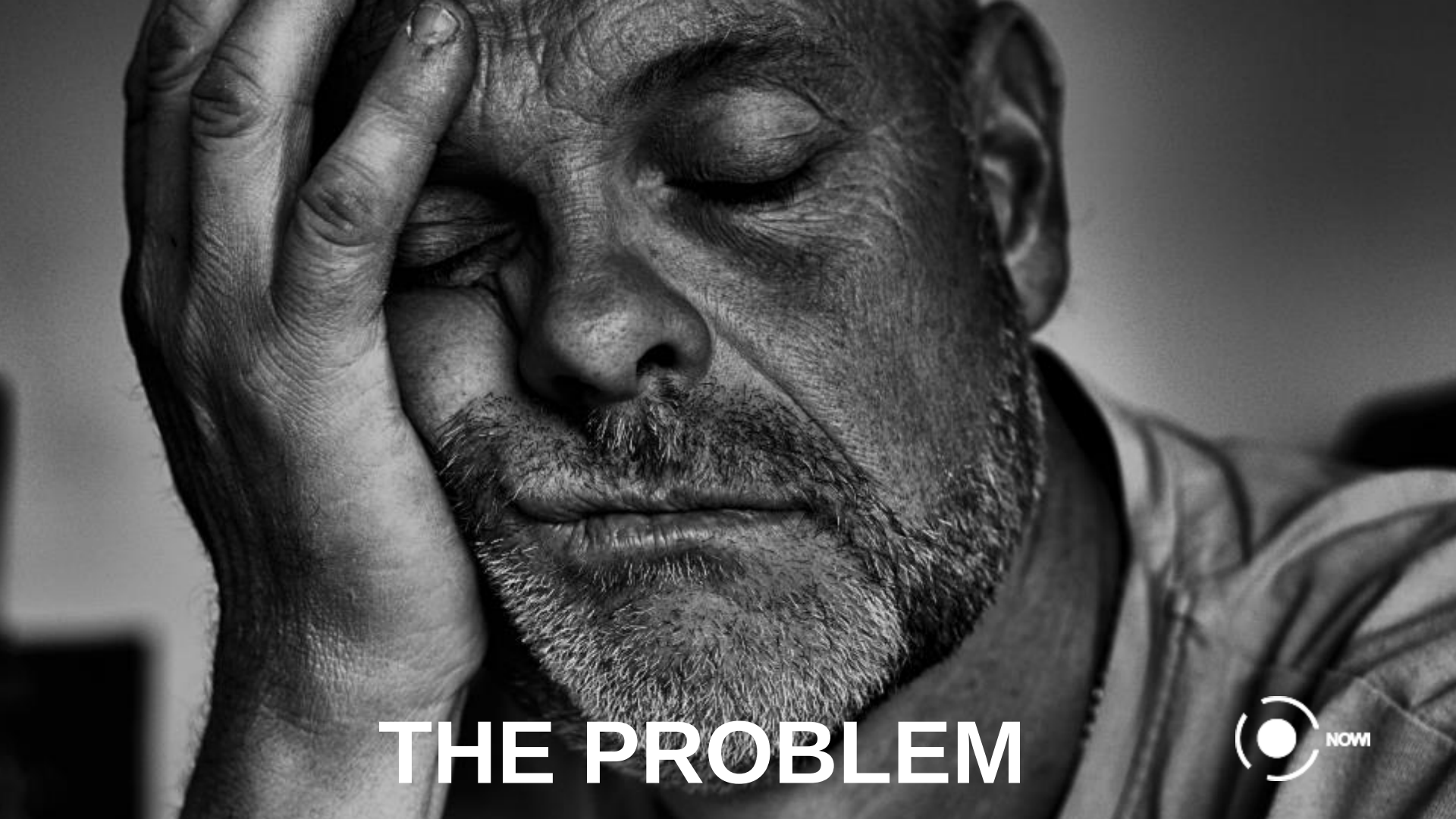
Chris Juliano, VP Strategic Partnerships
Dr. Andre Mansano, Chief Technology Officer

NOWI


SMART
WATCH
BUILDING
ROAD
HOME
FACTORY


HOW TO BE SMART
SENSE
THINK
ACT
NOWI


A world that feels requires billions of wireless sensors



THE PROBLEM

- €5/meter cable
- Impractical
- Unpleasant

- €1-2 battery/change
- €10-35 labor cost /change
- Polutting /Hazardous
- **Impossible or unpleasant**

THE PROBLEM

NOWI

‘Plug & Forget’ IoT device

Ultra-low maintenance

Ultra-low cost of ownership

Energy Harvesting

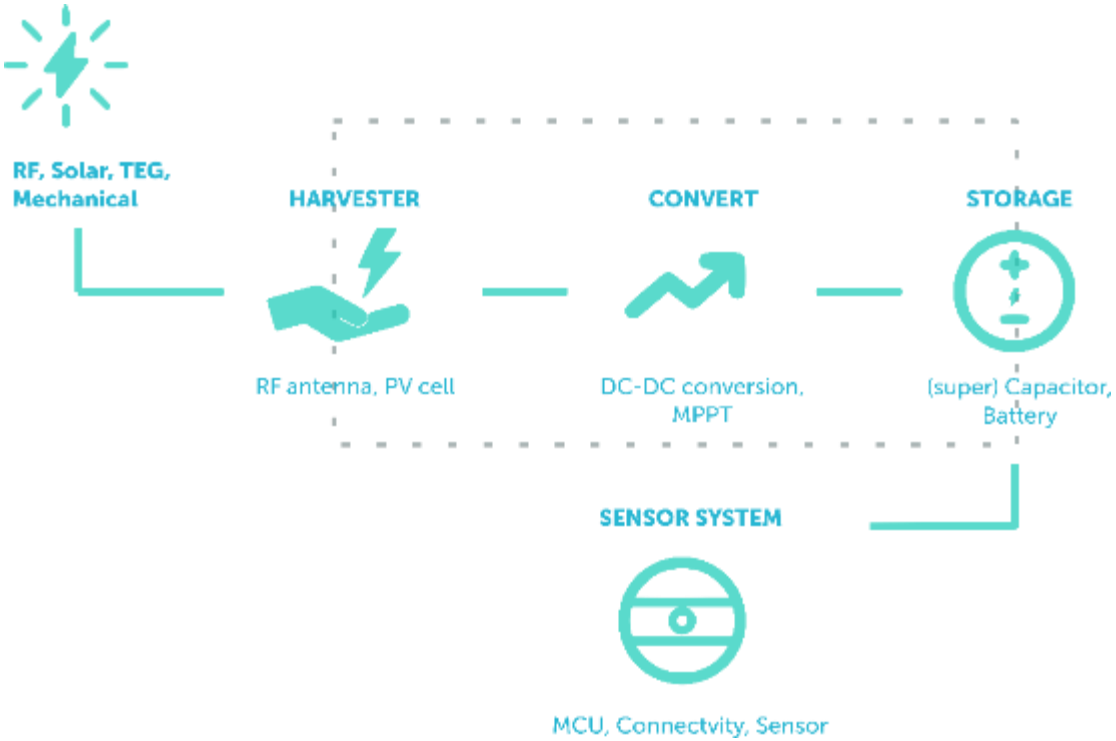
Radio Frequency

Solar PV

Piezo

TEG

Energy Harvesting

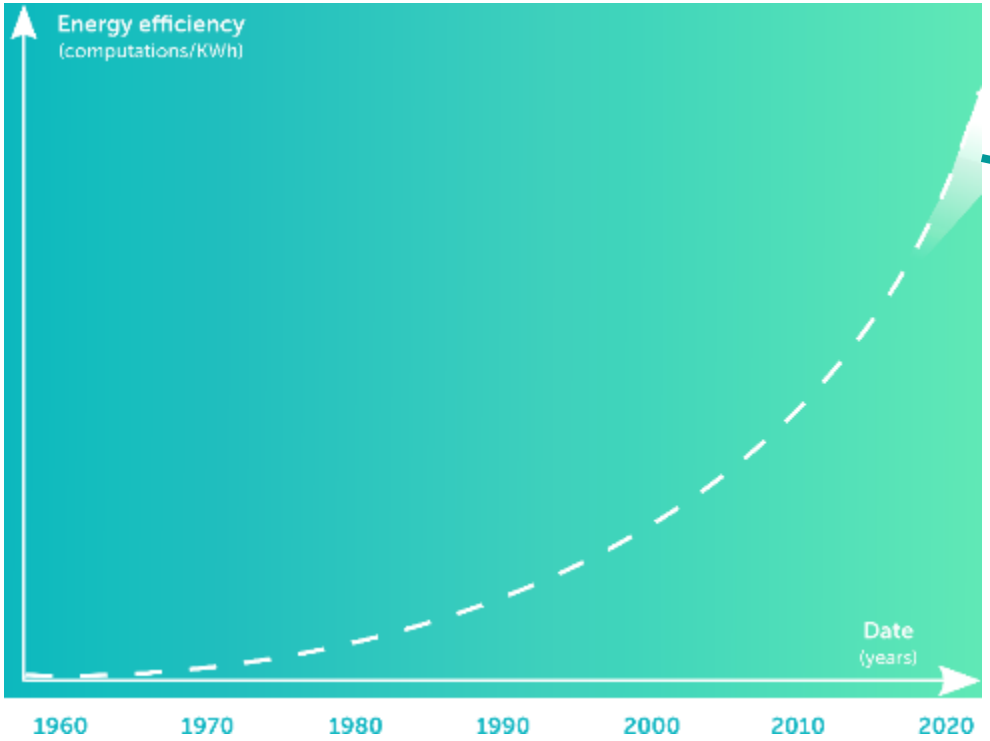


CHALLENGES

Historic problems in ‘ambient’ energy harvesting

1. Low-energy output (uW range)
2. Ultra-low Voltage output (20mV-500mV
3. High amount of external components (8-15)
4. Large form factor on PCB (250-450 mm2)

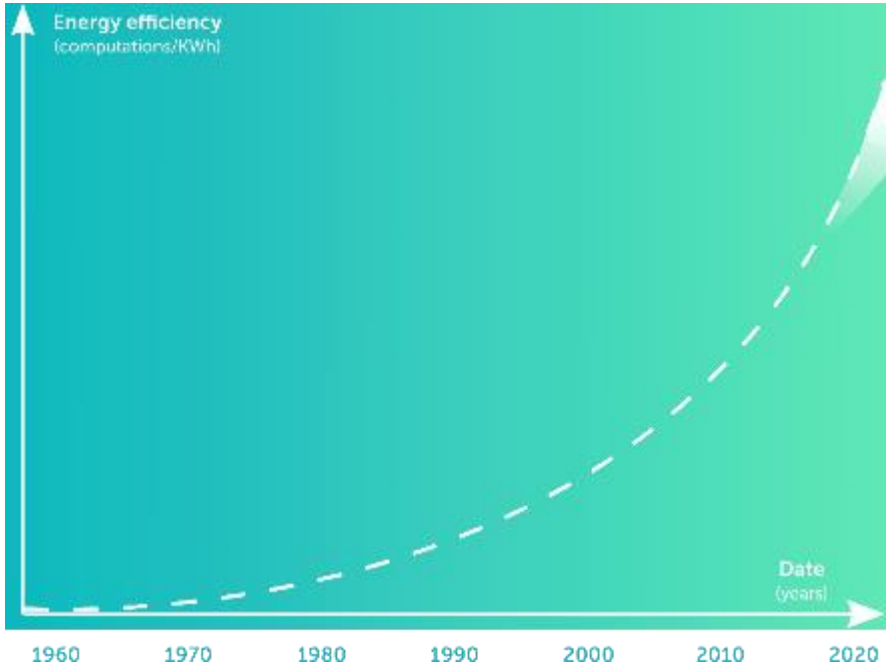
CHALLENGES (1/4)

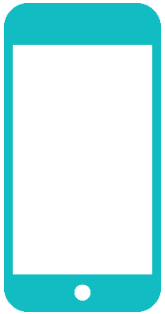


Energy need low power devices ≤ energy harvesting

"The right timing"

CHALLENGES (1/4)





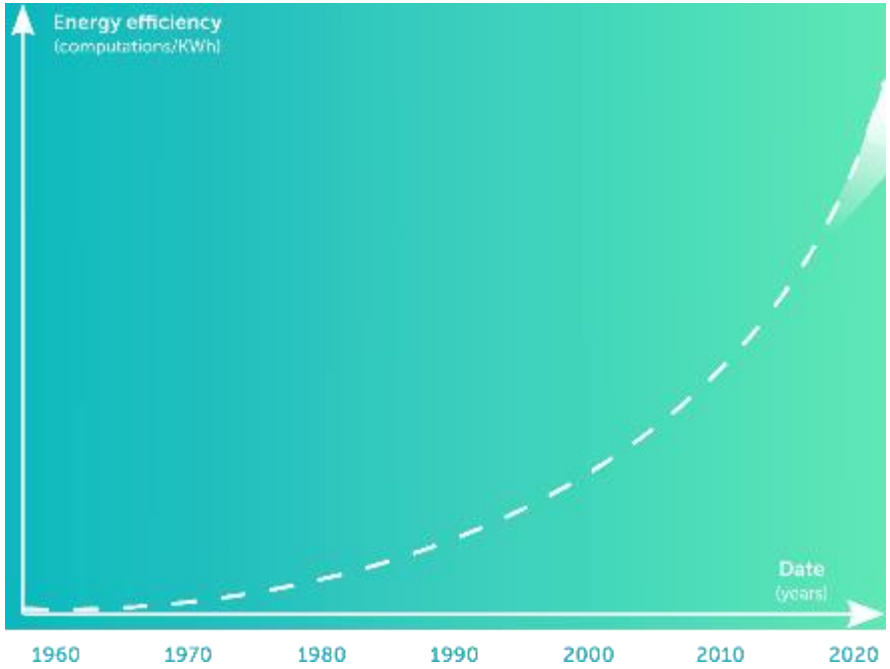
Consumer electronics

+ efficiency
+ features
≈ consumption

IoT connected devices

+ efficiency
≈ features
> consumption

CHALLENGES (1/4)



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CHALLENGES

NOWI Energy Harvesting PMIC

- 6 patents
- 10 years academic research
- 8 innovation awards

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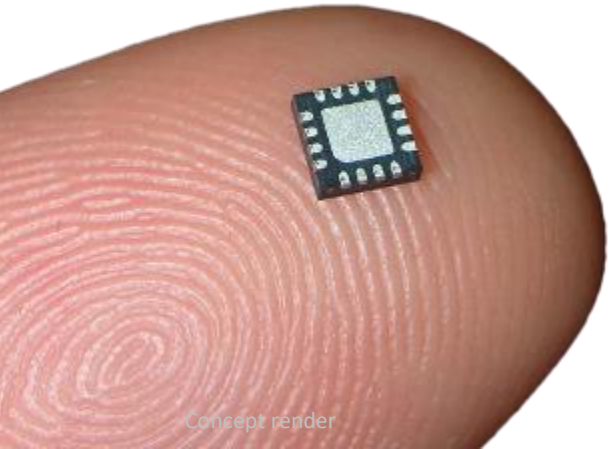
CHALLENGES (2/4)



Concept render

Low Voltage output

- World’s lowest Voltage boosting (40mV)
- World’s highest boosting efficiency (92%)
- A.I. powered MPPT

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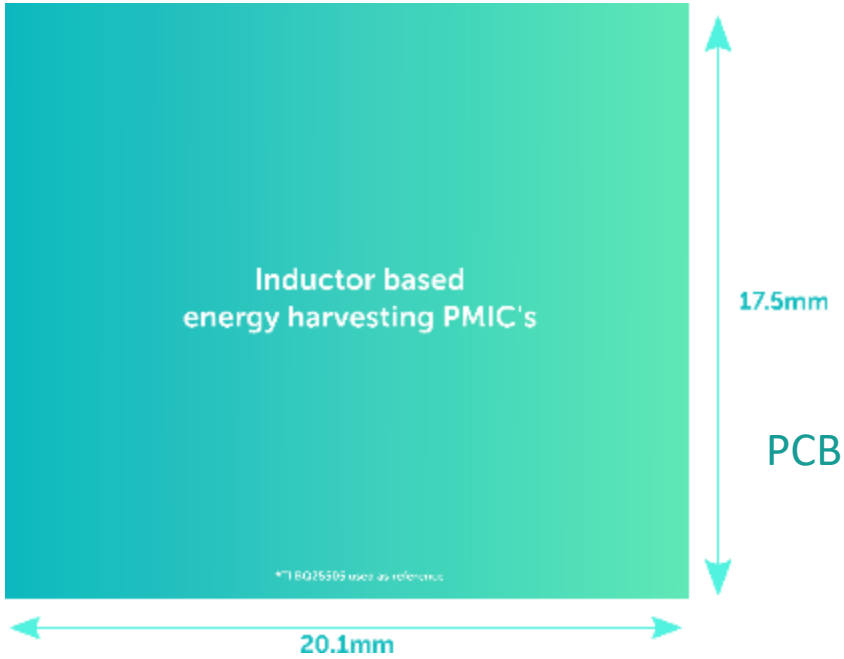
CHALLENGES (3&4 / 4)

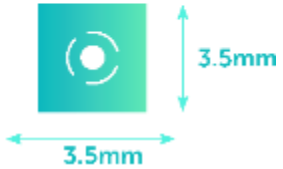
PCB assembly area: 350mm2



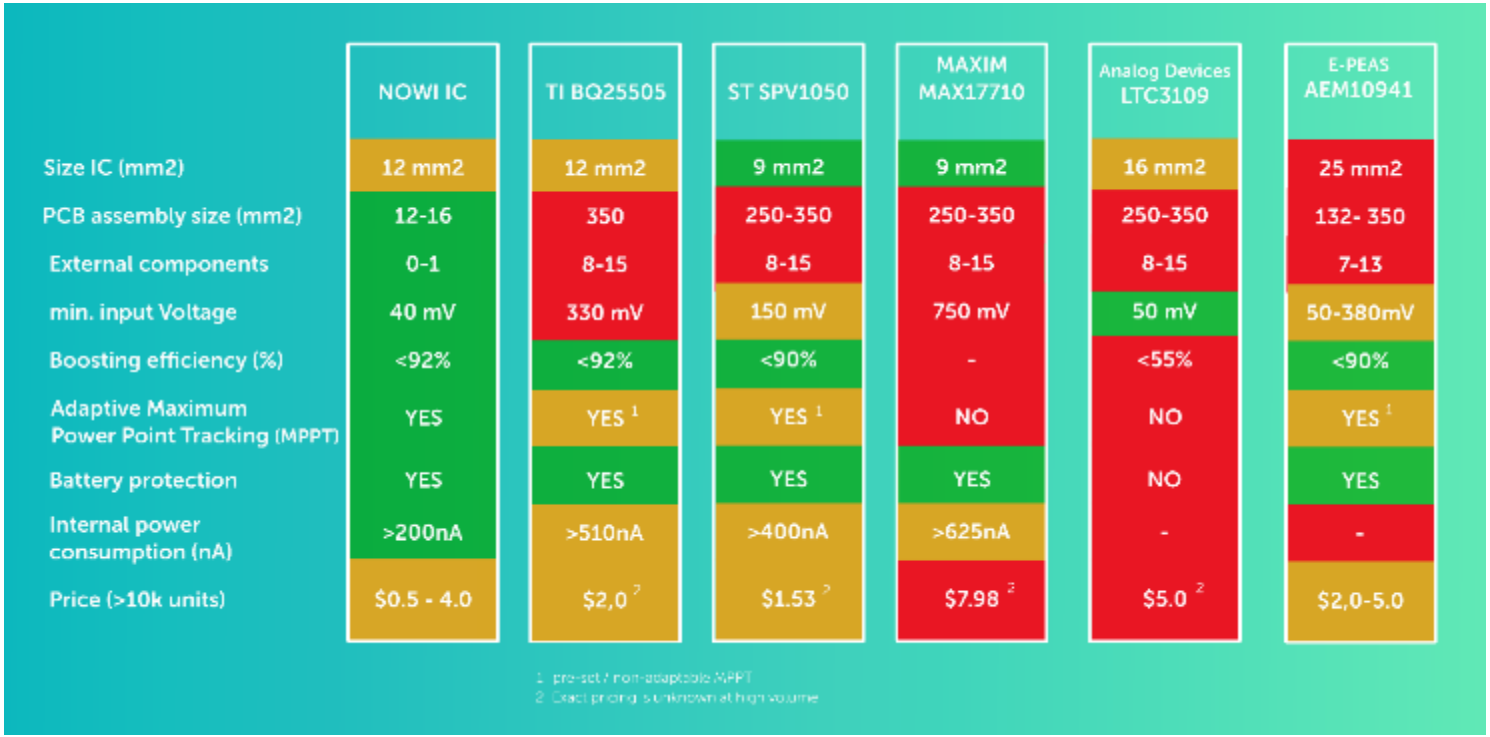
Fewest external components & smallest PCB area required

- Nowi requires 0 or 1 external components whereas alternatives require 8 to 15
- **~30x smaller footprint** PCB area possible

PCB area: 12mm2



COMPETITOR OVERVIEW




PROGRESS COMES FROM
GIVING MEANING TO
TECHNOLOGY
NOWI

Asset Management in Amsterdam

Asset Management with Prorail

Office Climate Management

NOWI

Complete Hybrid Watch Module from MMT using Nowi PMIC tech

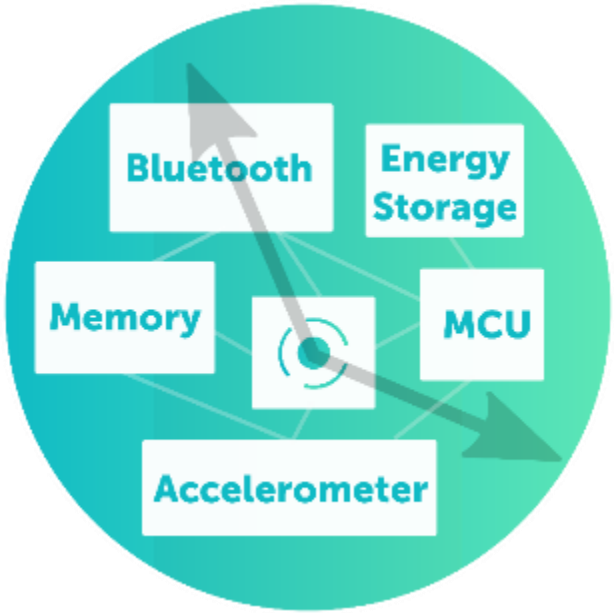
MMT
SWISS CONNECT

NOWI

Plug & Forget Wearable

John
47 years

Plug & Forget Wearable



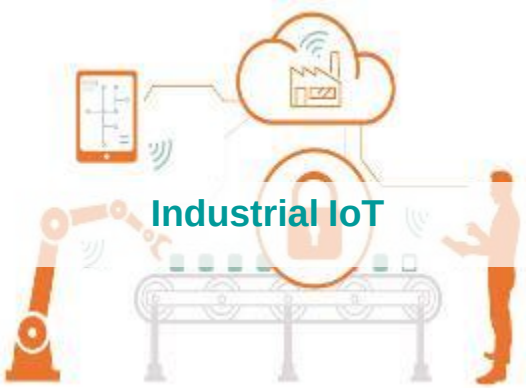
- Activity tracking
- Calorie counting
- Sleep tracking
- Auto time/date updates

Requires **31 uW** on average

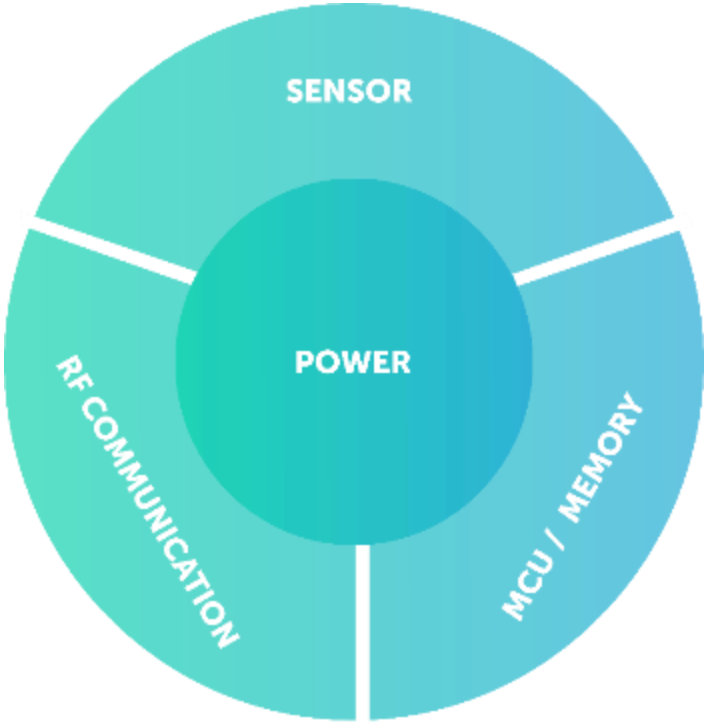
Plug & Forget Wearable

Full functionality, will never run out of power

SCRATCHING THE SURFACE

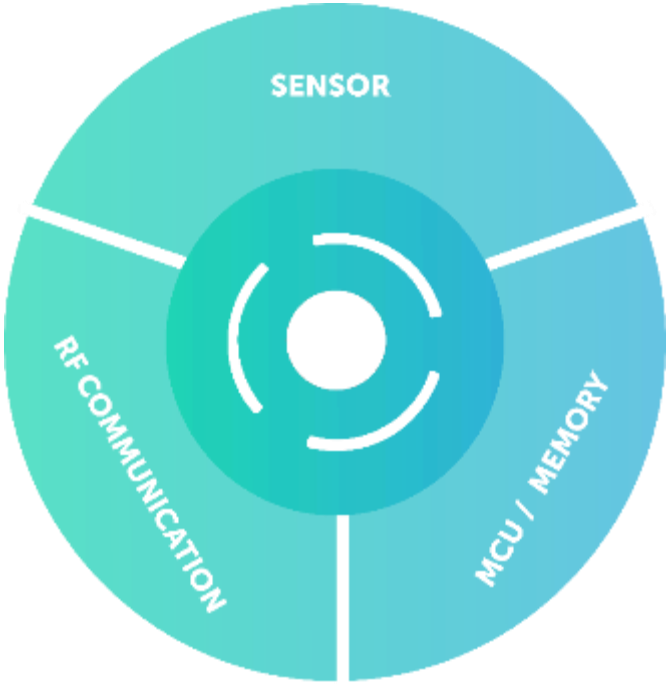


DIFFERENT PRODUCTS SAME DEVICE



SENSOR SYSTEM OVERVIEW

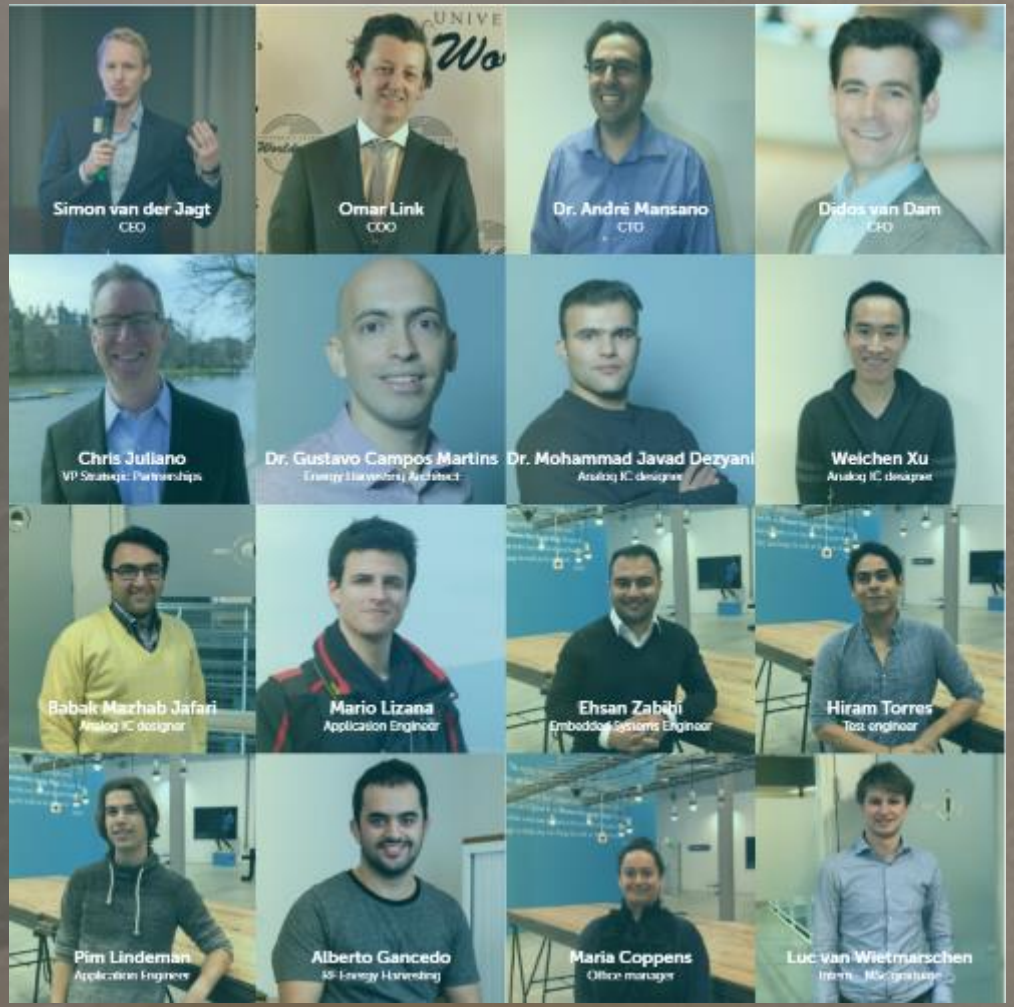
DIFFERENT PRODUCTS SAME DEVICE



Nowi Power Module IC
as heart of Sensor system

NOWI

TEAM



3x PhD

7x Msc

TEAM ADVISORS

Investor in Wehkamp, FoxIT etc. former CEO KPN telecom

Head of bioelectronics lab TU Delft, full professor

Head embedded system lab TU Delft

Founder of Quby (Toon) smart thermostat

Founder Uvision and Scyfer, both acquired by Qualcomm

Founder P&O one of the largest financial consultancies in NL

INNOVATION AWARDS

accenture
Innovation Awards 2016
WINNER

Smart Cities India 2017
WINNER

Asian Utility Week
INNOVATION AWARD FINALIST

CHINESE ADVANCED SEMICONDUCTOR ASSOCIATION (CASA) 2018
WINNER

ديوا
dewa
WINNER

PHILIPS
Innovation Award
FINALIST

ABOUT NOWI

- Founded in 2015
- ~€3m invested in product development
- 6 patents filed
- Located in Delft, the Netherlands

INNOVATION THAT ENABLES THE NEXT WAVE OF INNOVATION

NOWI

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