ELL-i: An open source hardware business

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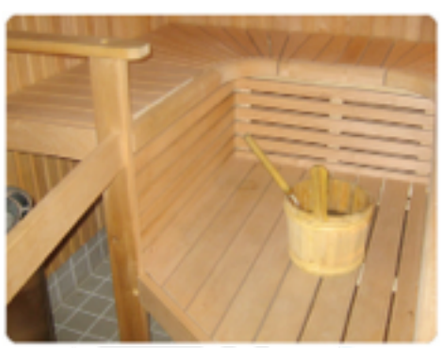
Elli Co-op

Presentation contents

- Ell-i: The story behind
  - The team
- ELL-i: Open Source Hardware business
  - A new way to grow business
- ELL-i: a technical platform
  - ELL-i vs. Arduino
- Summary

The story

- Started by
  Pekka Nikander & Teemu Hakala in Summer 2012 in Helsinki
  - Pekka has had home automation since 2005
    - Sauna not integrated; actuator & sensor issues
  - Teemu wants to automate lights, car warming, …
- Power-over-Ethernet looked good
  - Power and control in a single cable
  - Uses existing CAT5 cabling (from the 2005 system)
  - Clearly growing towards higher power levels
- And the whole story grew from there …



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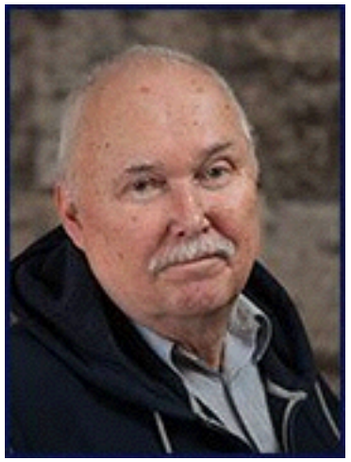
The team

Software

Legal



Electronics

IPR

Electricity

Management

Design

Safety

ELL–i: Open Source Hardware business

open source hardware

coop

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Open source hardware

- In 2012 market was expected $1B by 2015
  - SparkFun revenue $10M in 2012
    - Altogether 13 companies > $1M in 2012
    - e.g. Arduino brand revenue $1M in 2010
  - (more recent numbers not available)
  - Over 2 million RasPis sold by Nov 2013
- Atmel, Intel, NXP, STM all Arduino compatible
- But what is the best business model?

Open source in general

- A necessity these days unless
  - you have deep pockets (rely on VCs)…
- Lowers the entry barrier
  - also for competitors…
- Enables open innovation
  - but you still need a business model for it…
- Creates a marketing platform
  - word-of-mouth marketing…

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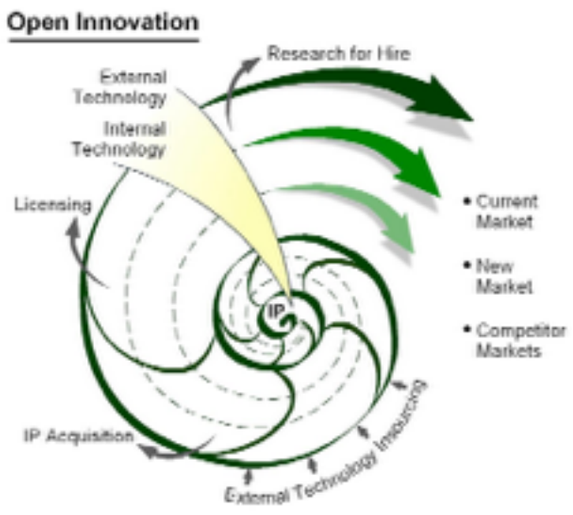
Open innovation

- Create and nurture a “maker” community …
  - Enthusiasts that innovate
- … building on existing communities.
  - Arduino, Ninja blocks, Kick starter, …
- Create an incentive model …
  - Prestige, exclusivity, benefits, business
- … in the form of a co-operative.



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Organisational experiment

- The traditional VC model vs.
- A co-op based model

- The ELL-i co-operative
  - A meritocracy and an ecosystem
  - Inventive model
  - Early market challenges

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The VC technosystem

Series A

VCs

Equity

The Cofounders

The Employees

Series B

VCs

Equity

$19 billion buyout from Facebook!!!!

(Repeat until next bust or someone buys you out)

Nice new cars for the cofounders
A dinner for the employees

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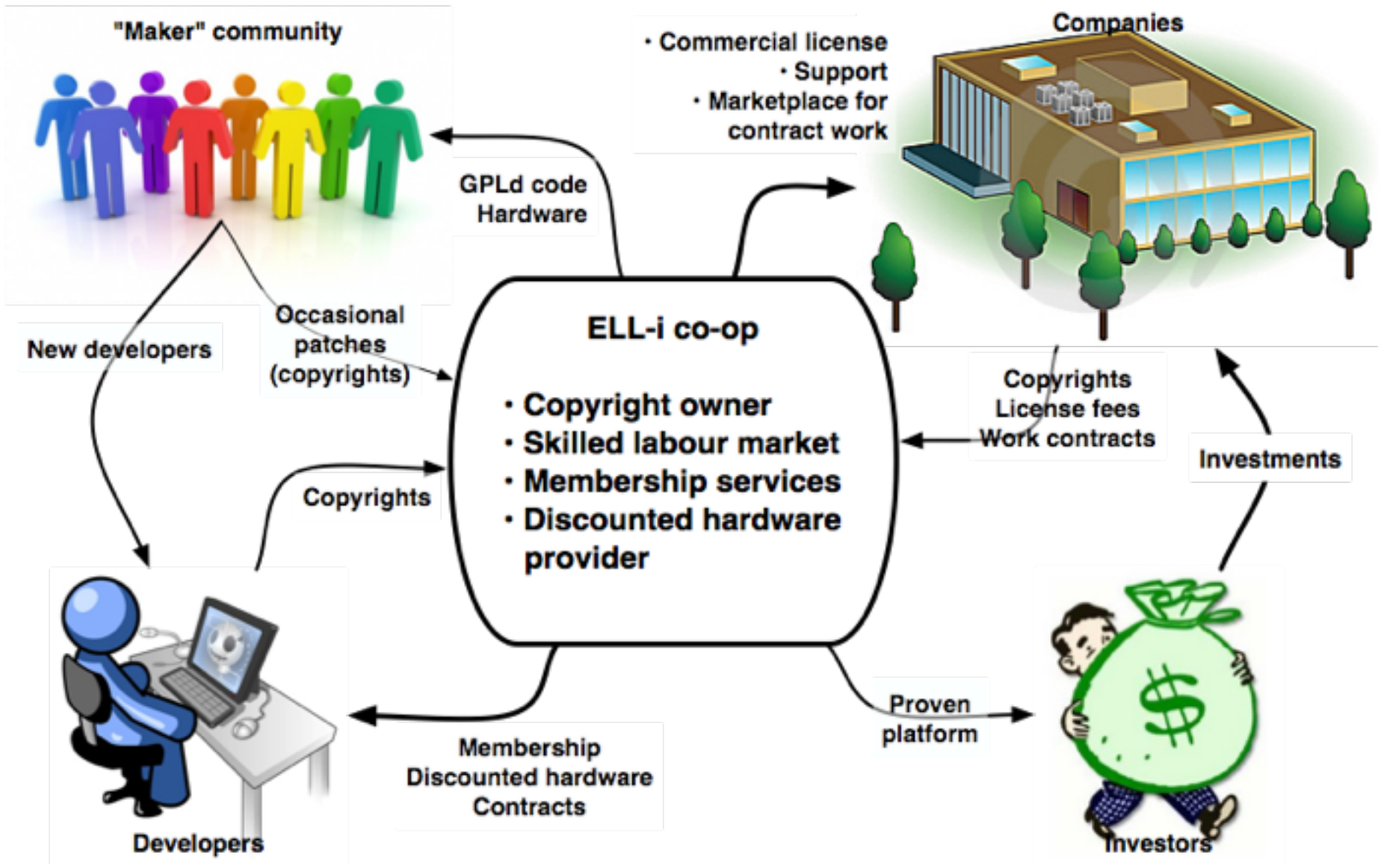
The coop technosystem



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ELL-i co-operative

- The home for the incentive model
- An organisational bases for forming an ecosystem

- **Co-own the software and hardware copyrights**
  - Anyone may donate copyrights & join the co-op
- Strengthen the community
  - Provide development hardware
  - Form a model for licensing the IPR
- Create a market place for skilled labour

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Incentive model

- Exclusive membership
  - Incentive to join
- Meritocratic governance
  - Incentive to contribute continuously
- Discounts to members
  - Incentive to stay as a member
- IPR licensing
  - Incentive for businesses

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Early market

- Establish a base
  - Build upon existing communities
- Make it viral
  - Value, Stories, Triggers, Emotions, …
- Spur it to sprout
  - An indegogo campaign

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ELL-i technical platform

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Platform goals

- **Intelligence** and **power** to everywhere
  - Inexpensive and flexible
  - Installable by anyone; no electrician needed
  - Easy to start with; Arduino compatible
  - Powerful, cloud connected, upgradeable
- Open sourced for Open Innovation

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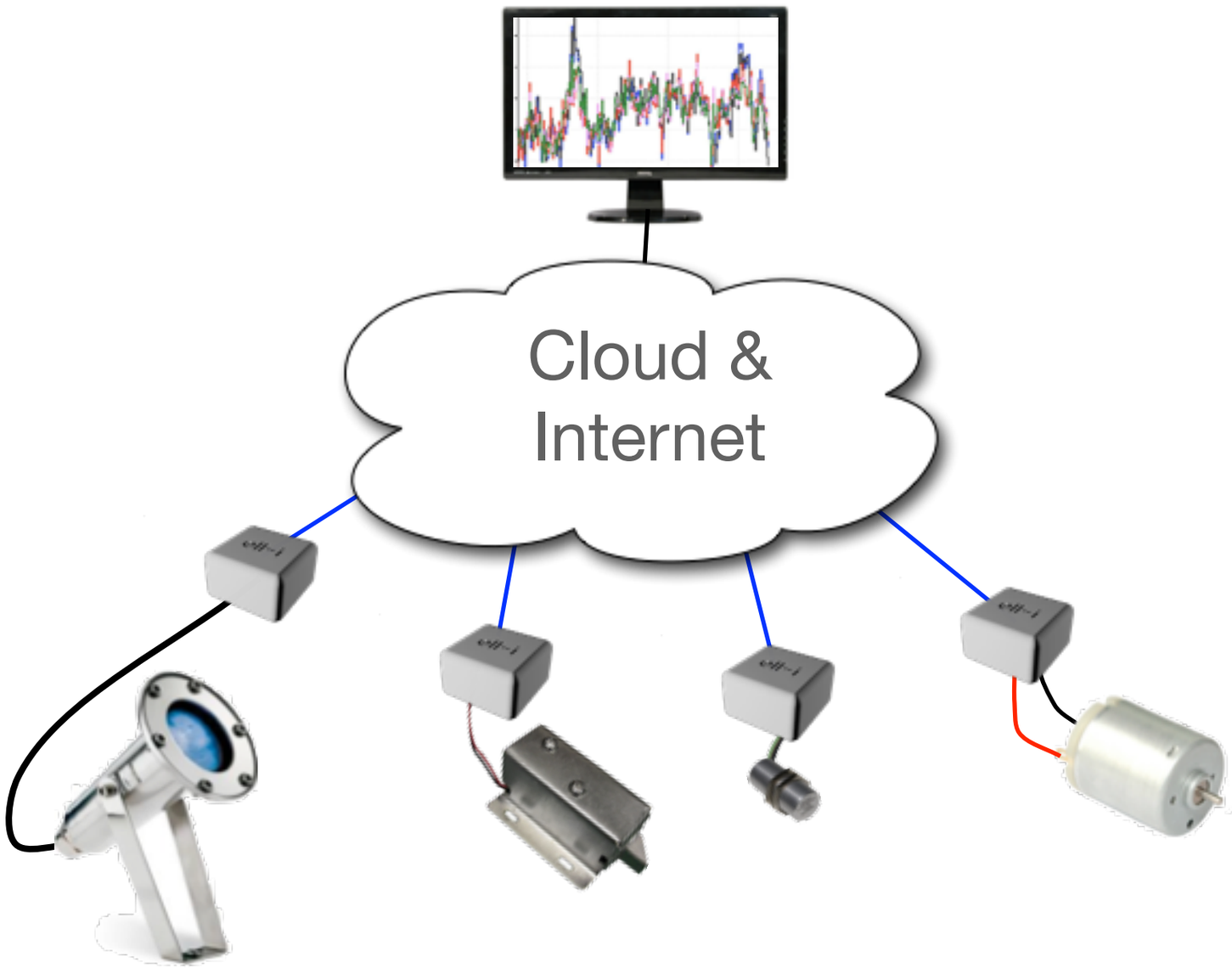
An ELL-i network



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ELL-i project:
The platform vision

LED lighting

Intelligent home

Industrial automation

Your own fixed, powered IoT vision

An open source platform

mW power

1–100 W = PoE

kW Power

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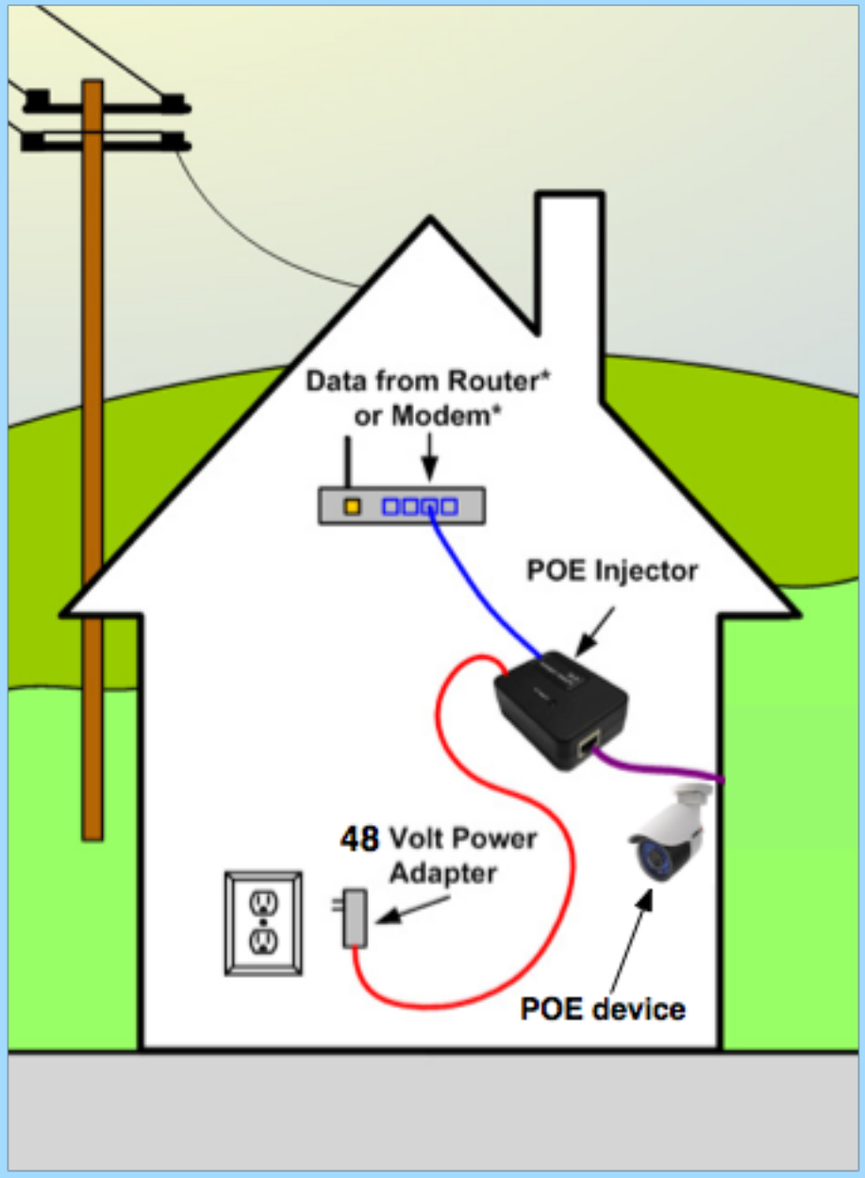
PoE in a nutshell

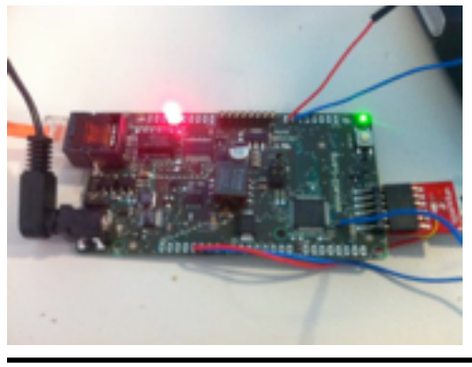
- Mains power converted to 48VDC
- Data and 48VDC through a single CAT cable
- POE device converts 48VDC for its internal use
  - e.g. 5V or 3.3V for MCU
  - e.g. constant current for a high power LED lamp



ELL-i technical roadmap

v1.0 prototype

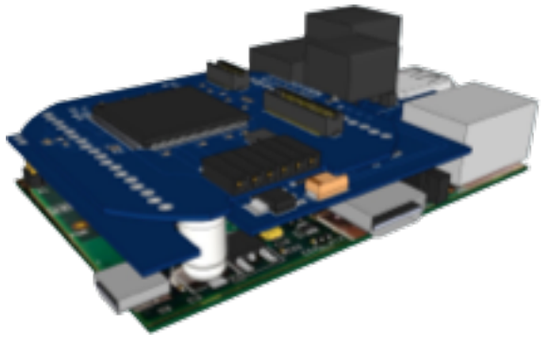
- Arduino compatible!
- 32-bit CPU
- 48 MIPS
- 16 kb RAM
- 64 kb FLASH
- 10 Mb/s Ethernet
- 13W of power



5/2013

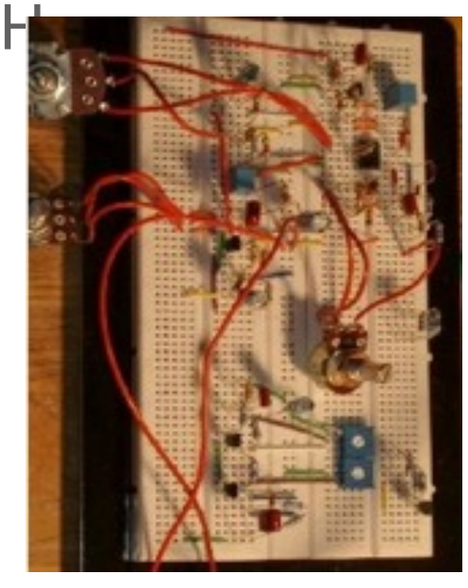
v2.0 design

- JS compatible?
- Two alternatives
- 48 or 180 MIPS
- 16 or 256 kb RAM
- 64 kB or 1 Mb FLASH
- 100 Mb/s Ethernet
- 13 or 25W of power



12/2013–3/2014

v2.0 prototype



4–6/2014

indiegogo

9/2014

v2.0 production

10-11/2014

ELL-i vs. Arduino:

	Arduino	ELL-i 1.0	Ell-i 2.0 (Baselli)	Ell-i 2.0 (Flotelli)
MCU	Atmel AVR	Cortex-M0	Cortex-M0	Cortex-M4F
CPU speed	8 or 16 MHz	48 MHz	48 MHz	168 MHz
RAM	1–8 kB	16 kB	16kB	256 kB
Flash	16–256 kB	64 kB	64 kB	1024 kB
GPIO	~20	~40	~20	~40
Connectivity	UART, USB	UART, Ethernet	UART, Ethernet	UART, Ethernet
Power	USB	PoE, (USB)	PoE	PoE

Presentation summary

- A startup grown form our own needs
- Organised as a co-operative
- From almost nothing to a 20+ people organisation in 20 months with $20000
  - Two paid employees
  - A product almost ready to launch

- Focus on open source hardware & software
- Making electricity “democratic”

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Thank you!

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