# Critical infrastructure protection: the responsibility of Government or of companies?

As delivered to the Joint Committee on the National Security Strategy
By Ben Goldsworthy (33576556)

# Who's this talking?

- Computer Science BSc student at Lancaster University

- 5yrs' computing experience

- Interest in cybersecurity

- Daily user of many elements of critical national infrastructure, just like you

Source: Author

# Just what is he talking about?

- Critical National Infrastructure (CNI)

- "[C]ritical elements of national infrastructure[...]the loss or compromise of which would result in[...]severe economic or social consequences or to loss of life."[1]

- Think power, water, the emergency services—all the stuff you'd rather not live without
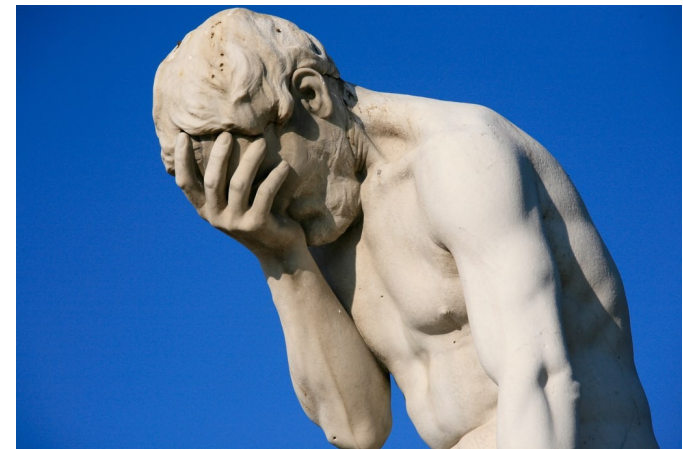
Source: CPNI

[1] https://www.cpni.gov.uk/critical-national-infrastructure-0

# "Why is this our problem?"

- General security breach best-case scenario
  - Financial losses
  - Political embarrassment
  - Annoyed constituents
- But we're talking about *critical* national infrastructure
- Remember that quote from the last slide?
- "...severe economic or social consequences or[...]loss of life".[1]

Source: Wikipedia Commons

[1] https://www.cpni.gov.uk/critical-national-infrastructure-0

# Let's look at an example

- The UK is aiming to have all households using smart meters by 2020

- Smart meters "can tell you how much energy you are using" and "communicate directly with your energy supplier".[2]

- As of 2016, "there are now 4.9 million meters operating across Britain".[2]

- Sounds pretty benign, right? Handy, even.

Source: BBC

[2] https://www.gov.uk/guidance/smart-meters-how-they-work

# But in reality...

- Smart meters are massively insecure

- "The guys making the[...]might not know a lot about making them secure. The guys making head-end systems know a lot about making them secure, but not about what vulnerabilities might be built into them".[3]

- "The FBI assesses[...]that as Smart Grid use continues to[...]fraud will also spread because of the ease of intrusion".[4]

Source: BGR

[3] https://www.ft.com/content/ca2d7684-ed15-11e5-bb79-2303682345c8

[4] http://krebsonsecurity.com/2012/04/fbi-smart-meter-hacks-likely-to-spread/

# "No big deal, they're only meters."

- They're used for automatic monitoring of usage by energy providers, cutting off those who don't pay their bills and suchlike

- Get control of the meters, and you can tell British Gas that Joe Bloggs no longer wants any electricity

- What do you know, neither do any of his neighbours…

- Or anyone in his town…

- Or his county…



Source: National Geographic

# "Psh. Blackouts, schmackouts."

- On Dec 23rd 2015, Ukraine experienced the world's first power grid hack

- Power went down at 15:30 for ~6hrs

- If that were to happen only in London this Monday:[5]

- Oh look, we've found that £350mil we were promised for the NHS



Source: *Business Insider*



> ▶ Scenario: Afternoon Tea, Interrupted
>
> Blackout region and time ✎✗
>
> Date:      01/31/2017  from  13 ▾  o'clock
> Duration:  6 ▾  hours
> Regions:   UKI2 Outer London
>            UKI1 Inner London
>
> Add blackout region and time
>
> Energy not supplied: 36.96 GWh
> Damage costs: 350.84 million Euro*
> *Results are adjusted for inflation.
>
> Export damage report:  pdf  csv

[5] http://www.blackout-simulator.com/

# There's more to it than the money

- The water grid is CNI

- A building without running water is considered unsuitable for life (cf. 9/11)

- "Damage to or destruction of the nation's water supply[...]could disrupt the delivery of vital human services[...]threatening public health and the environment, or possibly causing loss of life."[6]

Source: *The Odyssey Daily*

[6] https://fas.org/sgp/crs/terror/RL32189.pdf

# It'll take a joint effort

- "About 80% of UK CNI is owned and run by the private sector…"[7]

- Private firms should be responsible for securing their own systems

- Someone needs to be able to hold them to account

- But what else can you do?



Source: *The Huffington Post*

[7] http://www.computerweekly.com/news/1280097313/Is-UK-critical-national-infrastructure-properly-protected

# Old dogs…

- A big issue with smart meters is that "old-style[…]meter makers[…]are typically metal bashers rather than technology companies, and don't fully understand the complexities of the smart meters they have been asked to design."[8]

- You can have all the fancy security in the world; if John Q. Engineer still thinks using default passwords is secure, it's no use.



Source: *VetStreet*

[8] http://www.theinquirer.net/inquirer/news/2451793/gchq-intervenes-to-prevent-catastrophically-insecure-uk-smart-meter-plan

# …new tricks

- Funding is needed for nationwide training
- This is your area of expertise and influence
- The introduction of computing to the national curriculum was good start
- Security focus is needed



Source: Author

# Thank you