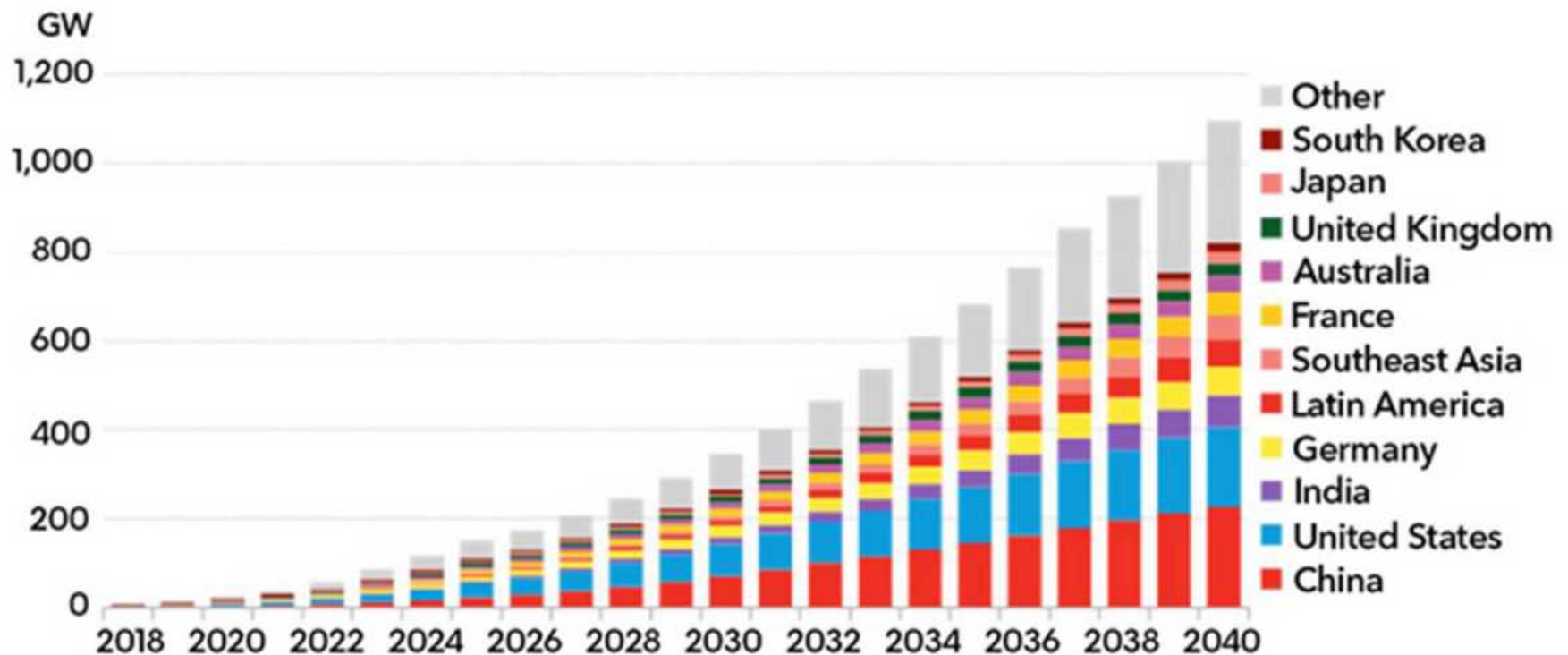


Great Growth (And Some Risk)

Global cumulative energy storage installations



Source: BloombergNEF

Energy Storage & Microgrid Training & Certification

Public Perception of Energy Storage ...



**2006: Massive global recall of lithium-ion laptop batteries
made by Sony Corp. totaled more than 7 million units**

... is ...



Oct. 2007, Matsushita Battery Industrial Co. Osaka, Japan

... not ideal:



March, 2008 LG Chem Plant Near Seoul, South Korea

Dreamliner



Nightmare Liner (2013)





Galaxy Note 7 (2016)

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2016: “Hoverboard” batteries catching fire

Not Just Consumer Products





APS
AZ
2019

Hyperdrive

Explosions Threatening Lithium-Ion's Edge in a Battery Race

By [Brian Eckhouse](#) and [Mark Chediak](#)

April 23, 2019, 3:58 PM PDT *Updated on April 24, 2019, 7:24 AM PDT*

- ▶ Battery exploded at plant in Arizona; two others were shut
- ▶ Arizona utility regulator calls for 'thorough investigation'

● LIVE ON BLOOMBERG

[Watch Live TV >](#)

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ARIZONA CORPORATION COMMISSION MEMBER QUESTIONS RISKS OF APS LITHIUM BATTERY SITES

ABC 15 NEWS - PHOENIX AUGUST 7, 2019



Government & Industry Safety Concerns

Battery energy storage systems (BESS) are a serious safety risk if not correctly installed, potentially leading to:

- Electric shock
- Fires
- Arc Flash
- Flash burns
- Explosions
- Exposure to hazardous chemicals



Key: “*if not correctly installed*”

How Do We Avoid the Liability, Risk, and Negative Public Relations?

Install & Maintain Energy Storage Systems Safely



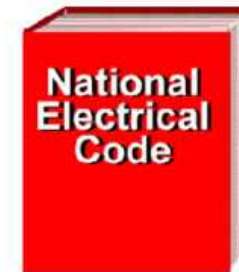
In response to safety concerns, ESAMTAC development led by Penn State, incorporates **national industry standards**



PennState



CalCharge



ESAMTAC - Energy Storage and Microgrid Training and Certification

- **Non-profit industry effort**
- **National Science Foundation – Advanced Technician Training (NSF-ATE) program funding**
- **Neutral, non-affiliated**
- **Collaborative, industry-wide process is foundation for**
 - **High quality, effective training**
 - **Safety, Safety, Safety**
 - **Optimum system performance**
 - **Certification recognized by industry, utilities, government agencies – public and private**

***“Proper training protects people,
enhances the public view of our
industry while lowering risk
and reducing liability”***

<https://www.esamtac.com>

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Bernie Kotlier

ESAMTAC

