Enhancing the safe transportation of lithium ion batteries

November 16, 2010

Battery Association of Japan

Analysis of the incidents

- According to the NPRM – Recent lithium battery incidents have been determined to originate from packages not in compliance with existing regulations.

- Similarly, investigation of incidents involving lithium-ion batteries during transport revealed non-compliant shipments.

June 18, 2010 - E-Bike Battery,
July 15, 2010-Santo Domingo, Dominican Republic,
August 14, 2010 – E-Cigarettes
August 25 , 2010– GPS Tracking Device

Serious non-compliant issues

Cells or batteries with ***a poor product design*** do not pass the UN tests(38.3) .

UN tests(38.3) shall be performed for all lithium-ion batteries

Table UN tests(38.3)

No.	Test item	No.	Test item
T1	Altitude simulation	T5	External short circuit
T2	Thermal test	T6	Impact
T3	Vibration	T7	Overcharge
T4	Shock	T8	Forced discharge

The effect of the proposed NPRM on air transport of lithium cells and batteries

Will the change reduce non-compliant shipments?

Doubtful !

The NPRM introduces additional requirements not in harmony with the rest of the world – it will lead to confusion and increase the number of non-compliant shipments seen each year.

Will the NRPM reduce future incidents?

No!

Obvious financial impacts on industry

Increased cost for air-transportation: (est. 5 times);

- Cost increase due to new packaging requirements;
- Crew-accessible locations and fire extinguish equipped area in airplanes are limited.

Additionally

- Ordering-cycles (product lead times);
- Supply Chain routes & locations;

The financial impact to BAJ companies alone exceeds ***$100M/year***

Notwithstanding the above, under the NPRM the effect on safety during the air transportation of Lithium-ion batteries in USA will be negligible.

First priority

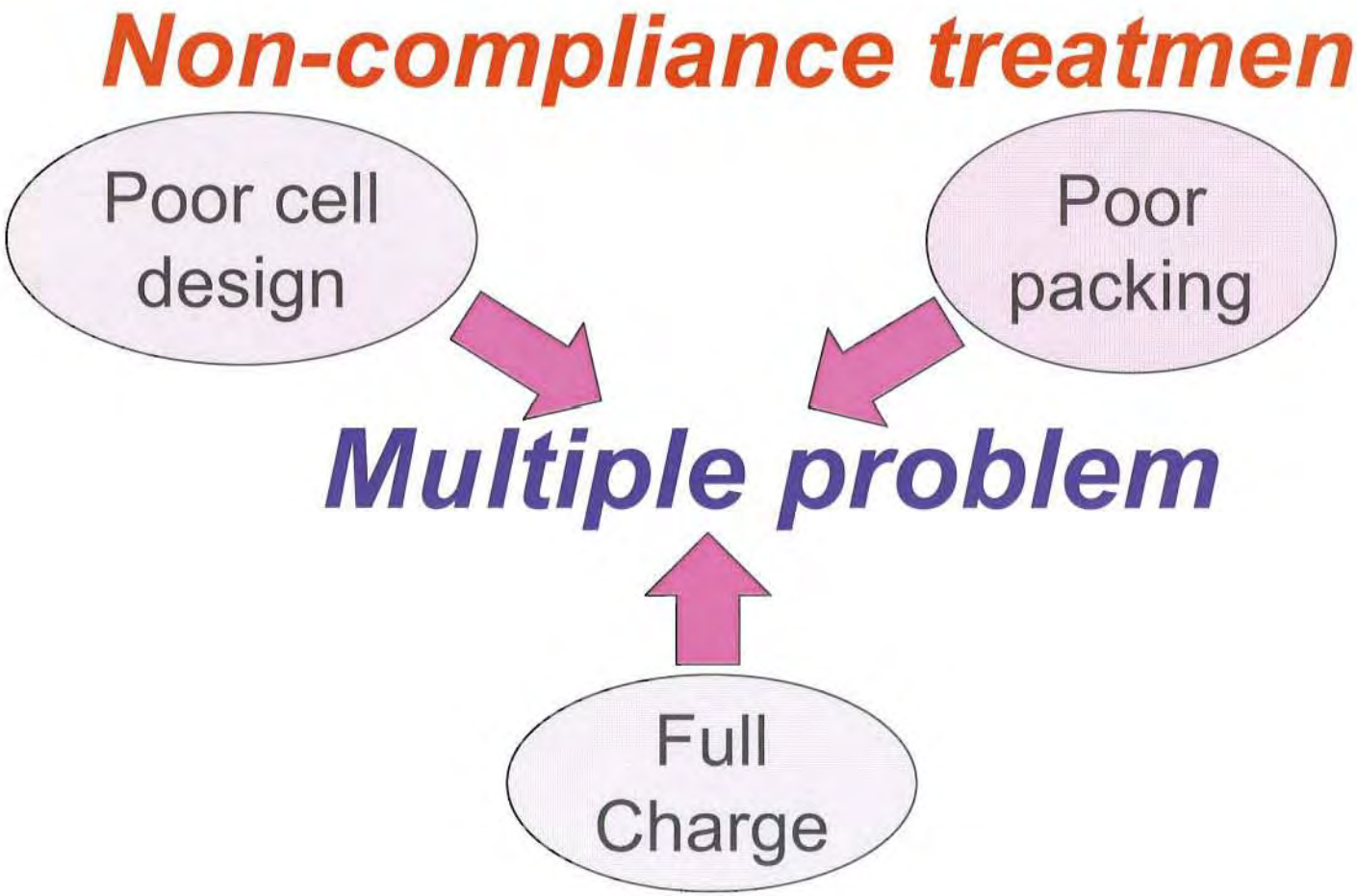
Strengthening enforcement of existing regulations

July 15 , 2010
Santo Domingo, Dominican Republic

Proposal from BAJ(Japan), KORBA(Korea) RECHARGE(Europe) and PRBA(USA)

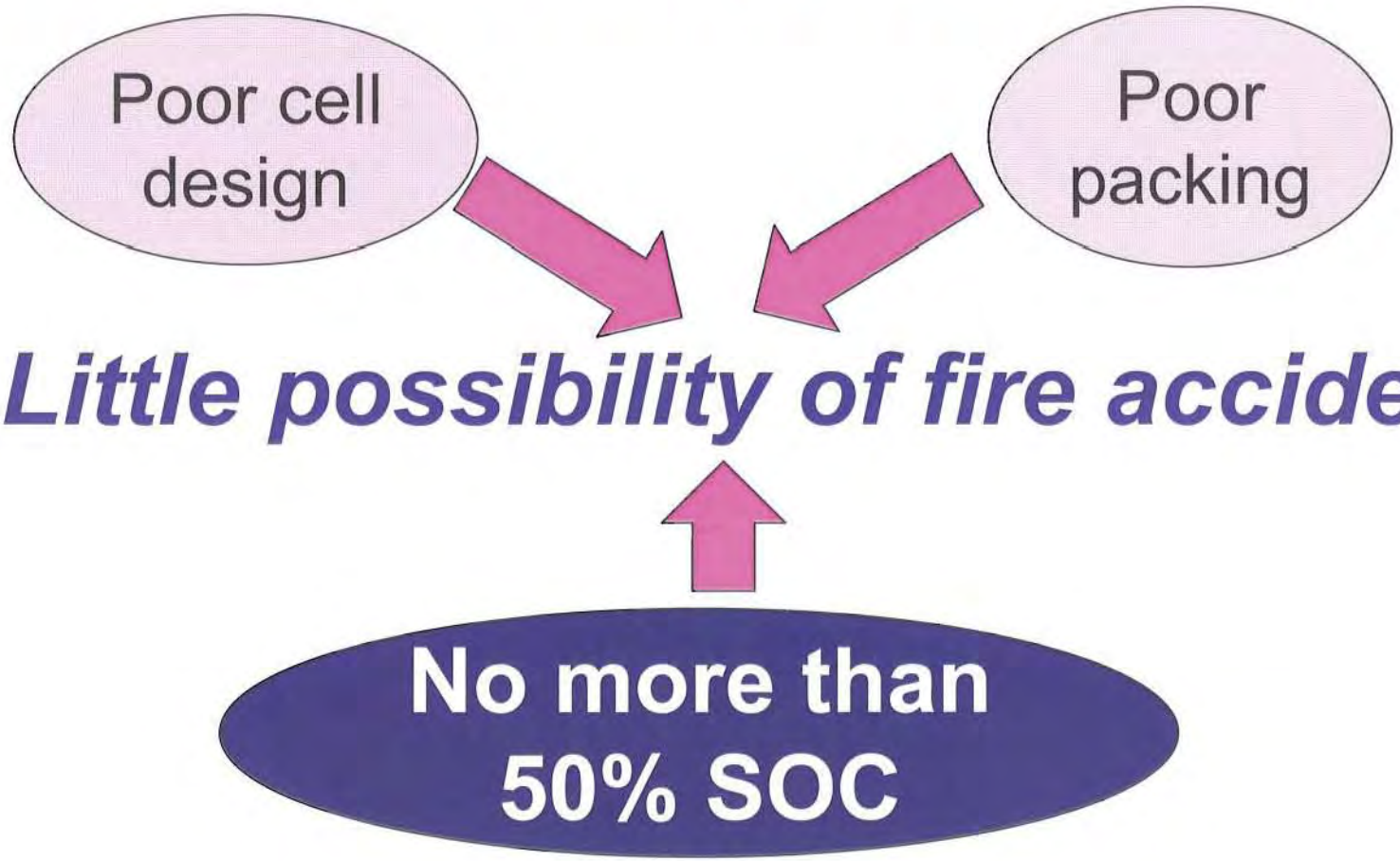
1. A cell's State of Charge (SOC) is critical in minimizing the effect of an adverse incident.
2. Under the NPRM, creating an exemption for cells and/or batteries shipped with no more than 50% SOC will enhance the safety of air transportation.

Probability of incidents during transport



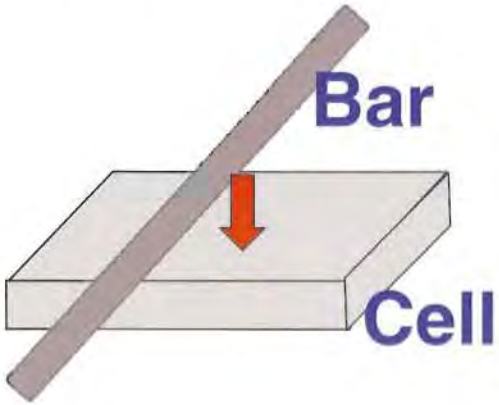
If the state of charge is controlled no more than 50%, …

Even if non-compliant treatment



Experimental Analysis

Crush test is conducted
under temperatures ranging from
80°C to 100°C (176 °F to 212 °F)



Internal short
circuit take place

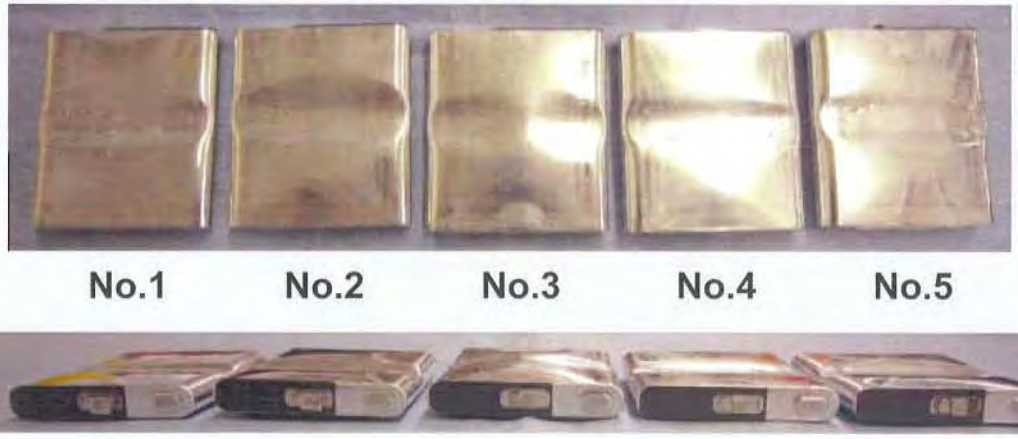
Test cells are designed safely, but these tests are conducted under extremely tough conditions.

Results 1 : Comparison of SOC

SOC:100%

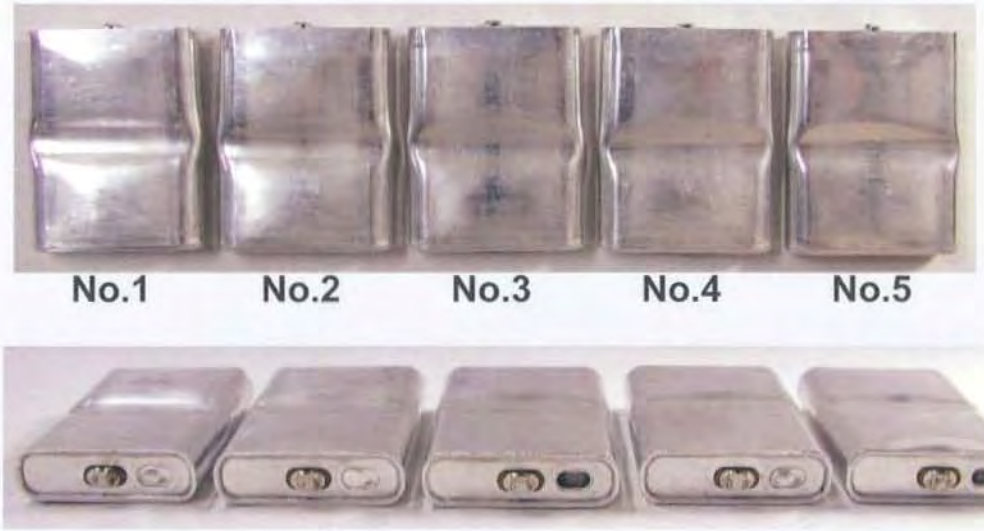
Temperature
80℃

SOC:50%



extremely tough conditions.

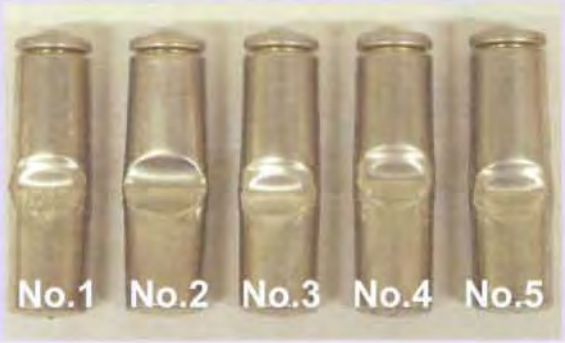
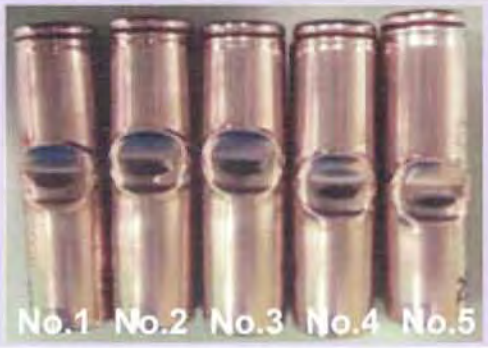
Results 2 : Toughness of SOC 50%



SOC:50%

Temperature
100℃

Results 3 : Toughness of SOC 50%

Type	Test Temp.	Battery Side	Battery Top
Cylindrical: ICR18650 (Company A)	100°C		
Cylindrical: ICR18650 (Company B)	80°C		
Cylindrical: ICR18650 (Company C)	80°C		

The effect on shipping with no more than 50% SOC on safety

Double protection

Keeping
UN 38.3
Test
(Safe design)

Keeping
no more than
50% SOC

Conclusion

Enhancing safety during air transport

When Li-ion cells and/or batteries are shipped with no more than 50% SOC (state of charge), those cells and/or batteries shall be exempt from the proposed rule.

The NPRM acknowledges SOC strongly affects the severity and effect of an event during transport (see page 1307).

This proposal was submitted to DOT by ***PRBA(USA)*** , ***RECHARGE(Europe)*** , ***KORBA(Korea)*** and ***BAJ(Japan)*** on November 2, 2010.

November 16, 2010

The Honorable Ray LaHood
Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, D.C. 20590

Re: Proposed Transportation of Lithium Batteries Rule
Docket No. PHMSA-2009-0095 (HM-224F)

Dear Secretary LaHood:

We offer the following comments from Japan, the US, Europe and Korea on PHMSA's proposed rulemaking on lithium batteries that was published on January 11, 2010.

The DOT rule revisions will fail to address the root cause of the problems it was set out to resolve whilst greatly disadvantaging both US consumers and industry, as is evident in the PRBA estimate of an economic impact of US$1.127 billion in the first year alone.

Our specific concerns are listed below:
• Lithium batteries are used in a wide range of electrical and electronic equipment, including computers, camcorders, digital cameras, mobile phones, smart phones and portable DVD players, so the revisions will also affect all of these products.
• The cost of packaging, transportation and storage of these products will substantially increase, ultimately being passed on to the consumers to absorb.
• Cargo transport orders will flood in for the limited number of planes that can carry dangerous cargo, creating massive confusion. In some cases, manufacturers will not be able to book their cargo, causing major transport delays or making transport by air effectively impossible. There will be some cases where manufacturers are forced to ship their goods by sea instead, which would not only be a major nuisance for consumers but would also cause business opportunities to be lost, impacting on US manufacturers, logistics firms and retail stores, etc., and even impacting negatively on employment in the US.

As associations whose members are key users of lithium batteries, we take lithium battery safety very seriously, far beyond simple economic and cost advantage issues. We foresee the DOT proposal as having a far greater economic impact than the DOT projected, and urge you to listen to the voice of industry as a key agent in economic activity and make a realistic judgment.

We too regret the incidents that have occurred in the US. However, we understand that, as noted in the NPRM, the incidents have basically been caused by non-compliance with

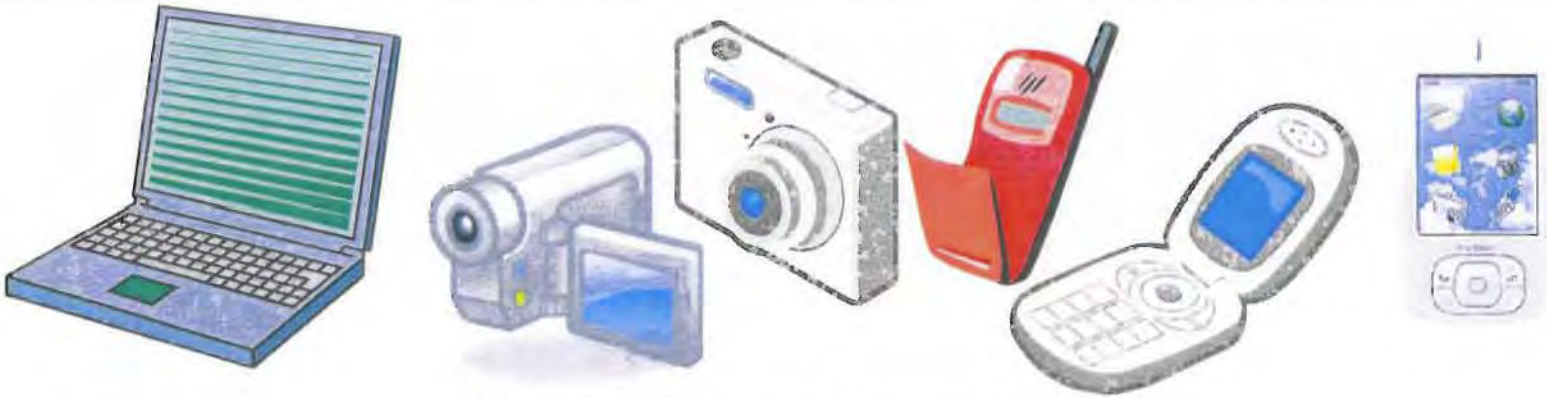
Negative impact of the US DOT's Proposed Changes to Lithium Battery Transportation Regulations on the US Consumers & Industries

November 16, 2010

Japan Electronics & Information Technology Industries Association

1. Great impact on American people's daily lives as various products use lithium batteries

Personal computers, camcorders, digital still cameras, mobile phones, smart phones, portable DVD players, etc.



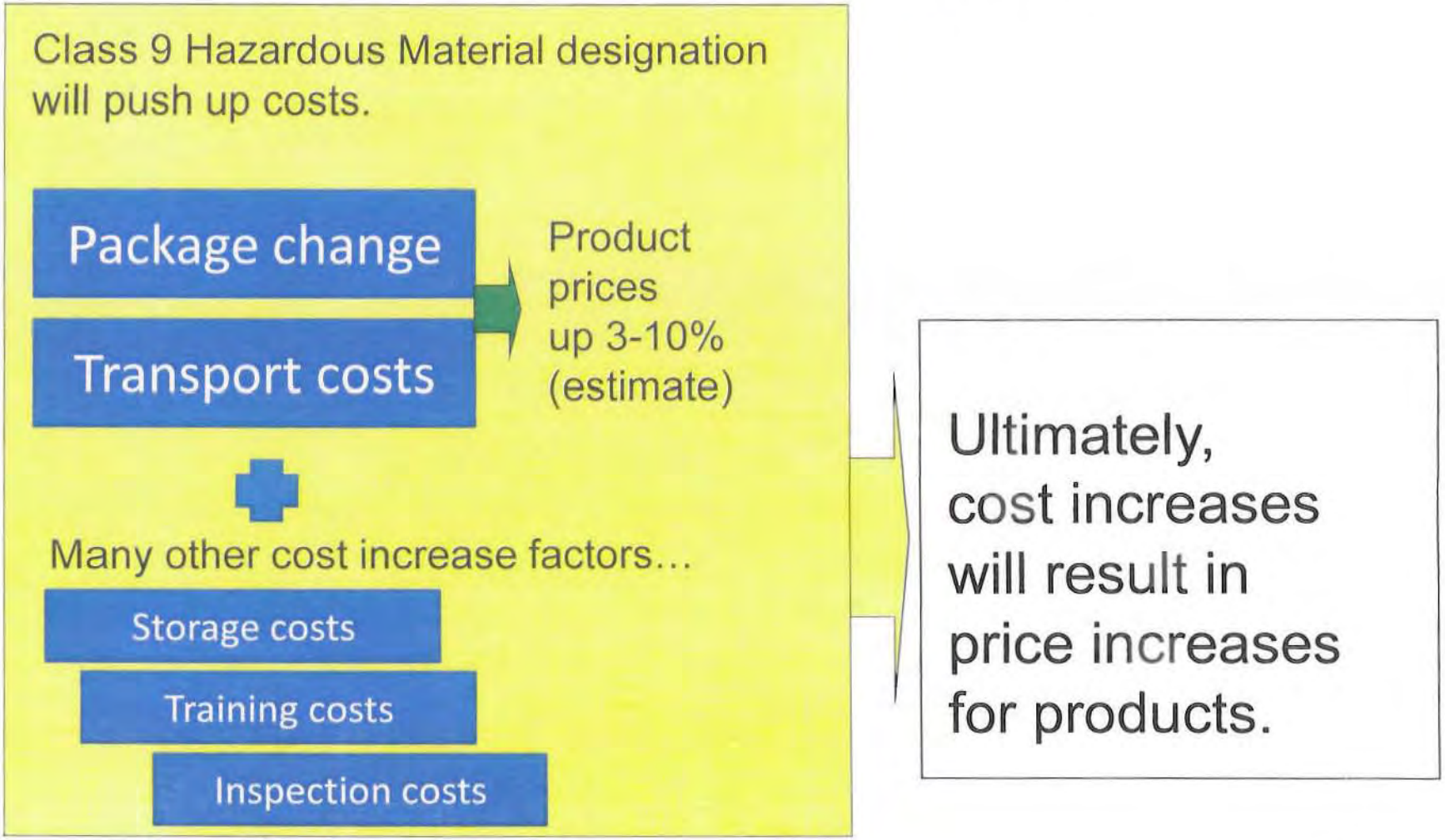
2009 US consumer market (Thousands)

Product	Mobile computers	Digital cameras	Camcorders	Standard Wireless phones	Smart phones
Unit sales	28,046	32,932	6,267	94,239	41,163

*excluding industrial uses

Source: CEA

2.1 Negative price impact on American consumers/industries and economy



2.2 Increase in packaging cost

Current packaging box

Class 9 packaging boxes

(Cardboard box : **Several dollars/box**)

(Fiberboard box: **10 times more vs. current cost**)

Hazmat labeling on box to be made for AIR only as transport by sea, road and rail does not require Hazmat labeling.

→ Additional operating cost

3.1 Delivery delays

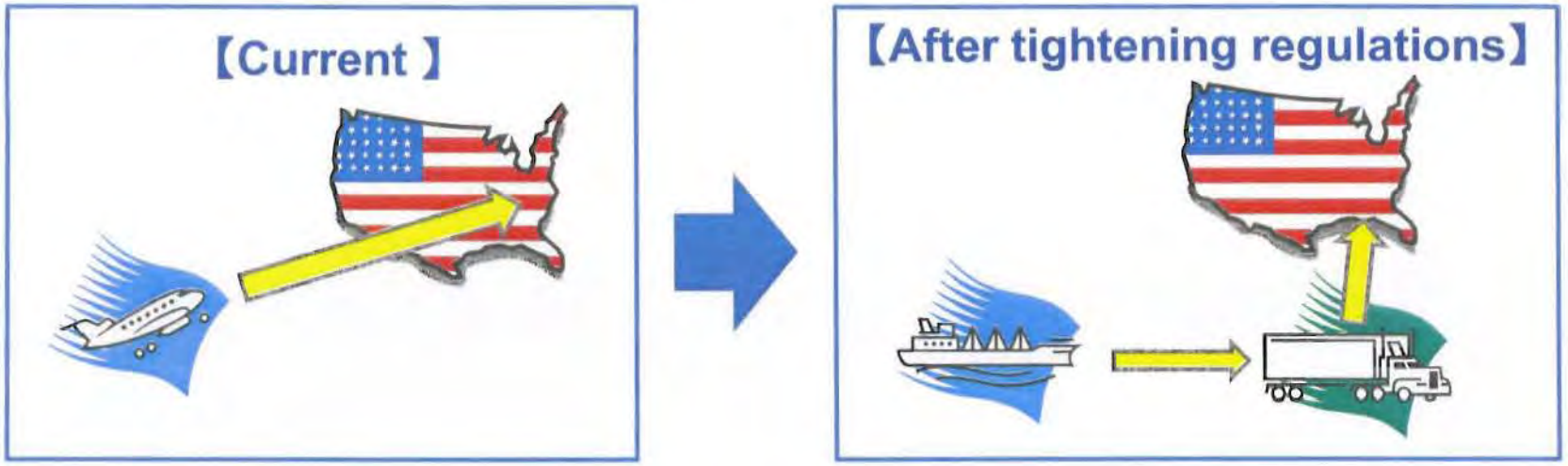
Transportation of Class 9 Hazardous Materials

Areas which air crew can access or Class C cargo storage areas (Products must be shipped in FAA-approved fire-resistant containers with automatic fire-extinguishing systems)

Air transport options will become extremely limited.

Transportation will be switched to sea and/or surface.

3.2 Possible delay of about one month by changing transport method from Air to Sea/Surface



Consumer inconvenience

Excessive inventories

Lost business opportunities

Extra burdens to transport & logistics firms, retailers and other business

Destroying Just-In-Time business model

Negative impact on US employment

4. Conclusion and Recommendation

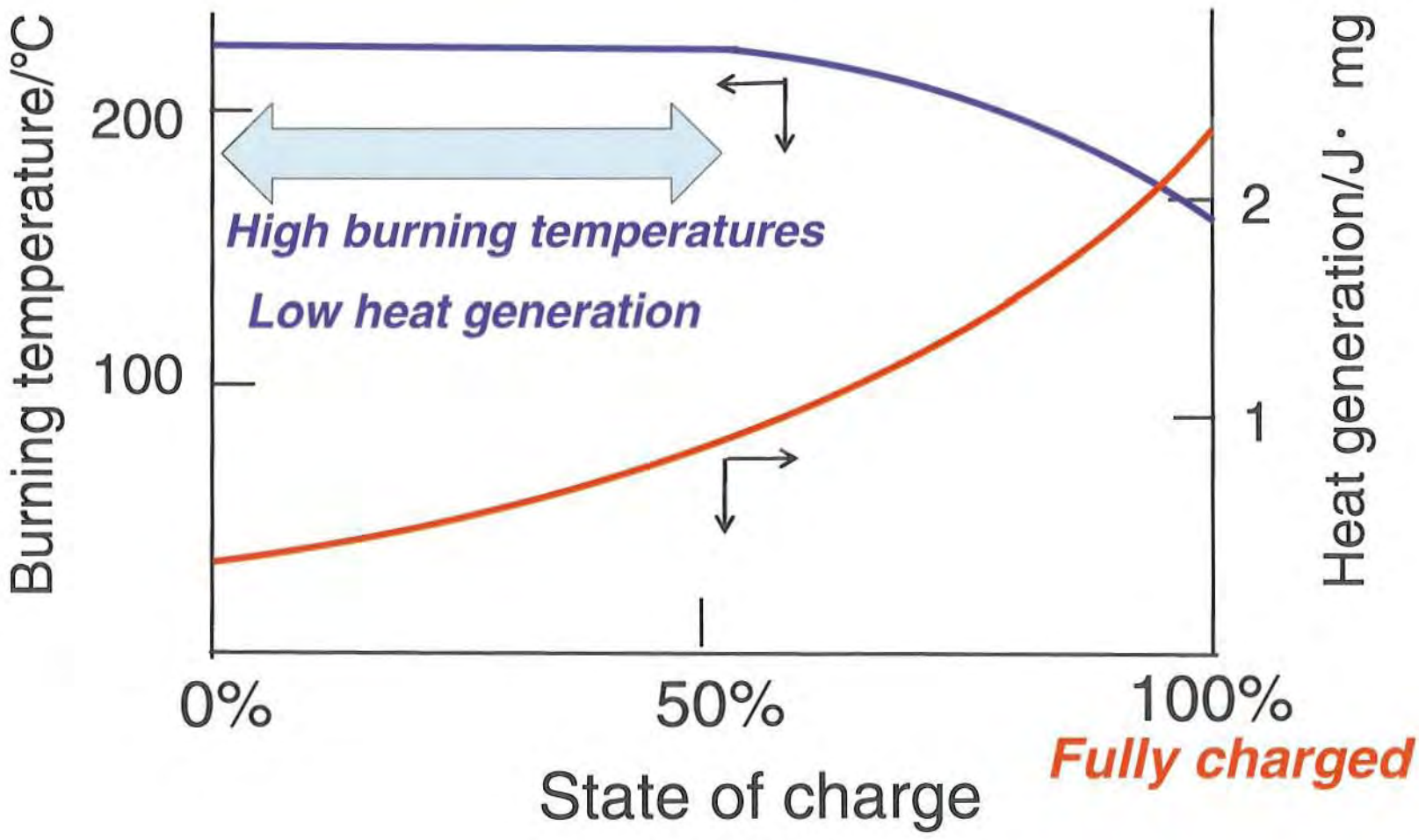
The DOT's proposed changes to
lithium battery transportation regulations
will send costs soaring and cause significant delivery delays.

In addition to massive inconvenience to consumers, business opportunities will be lost and business models destroyed.

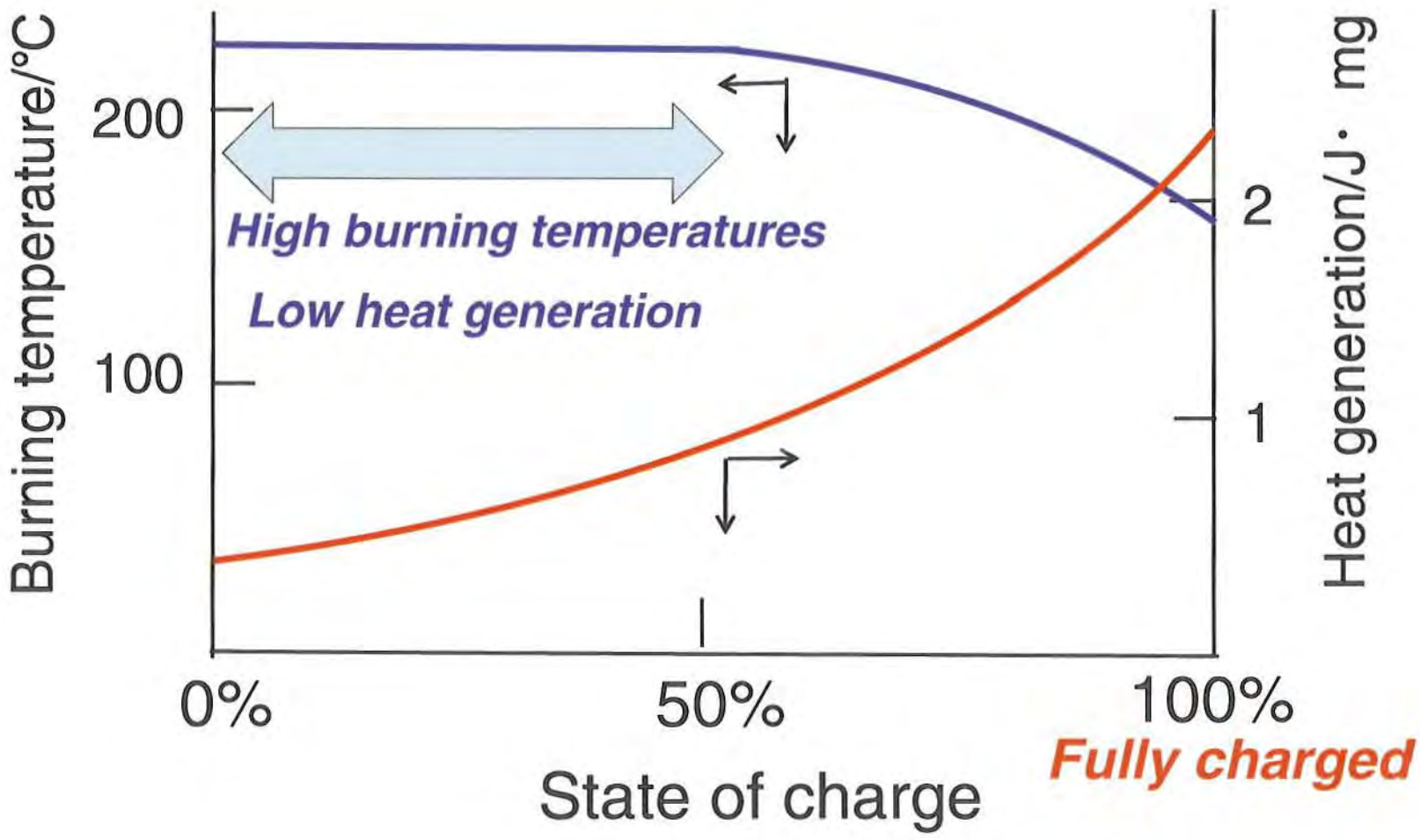
Entire US consumers/industries will be impacted, including manufacturers, transport & logistics firms, and retailers. In addition, US employment will be affected.

We strongly request that regulations be well-balanced between safety and economic efficiency.

The theoretical background



The theoretical background



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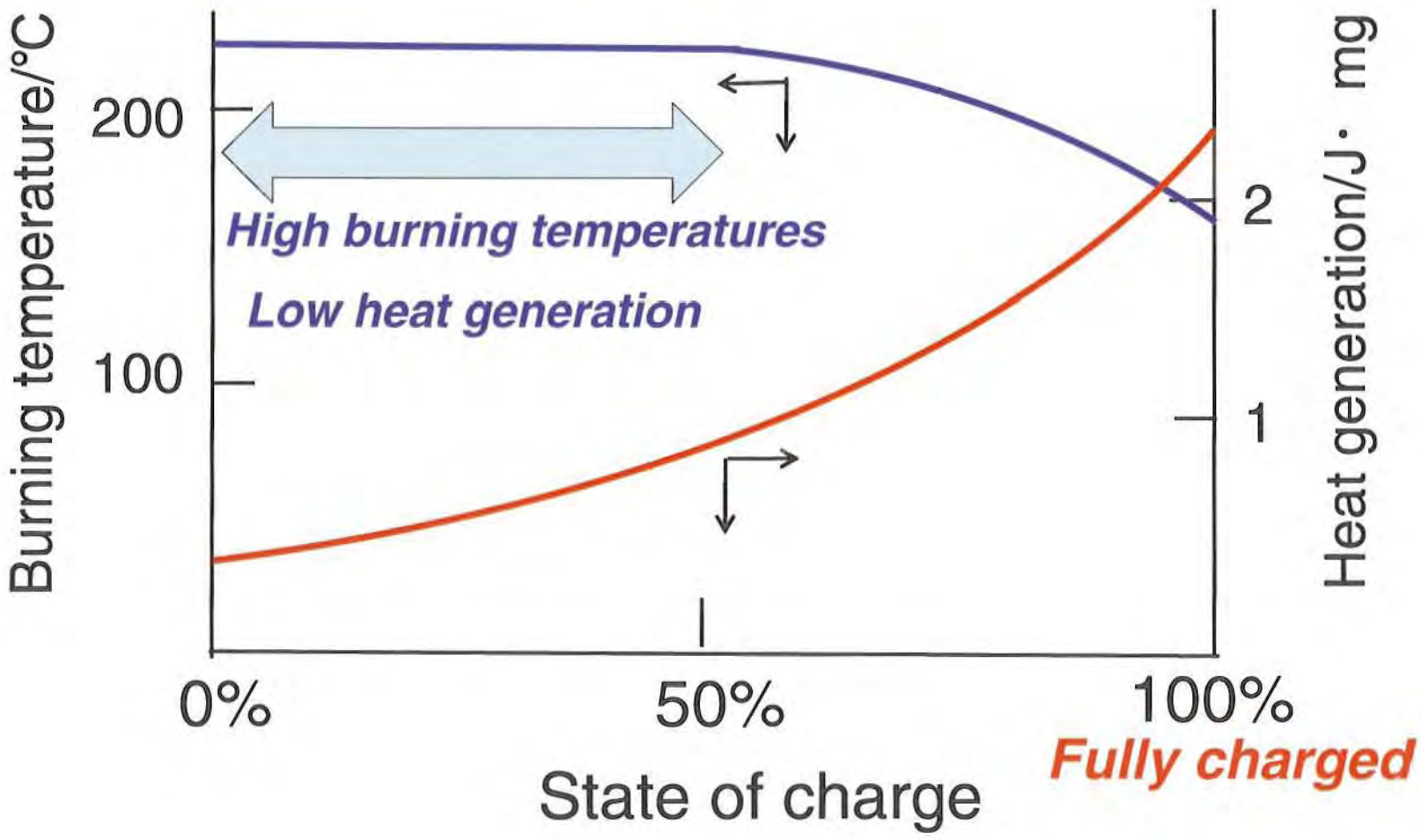

The theoretical background