**Testimony of Lindene Patton**

**Zurich Insurance Group, Ltd.**

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# Closing the Extreme Weather Resilience Gap

Chairman Carper, Ranking Member Coburn, distinguished Members of the Homeland Security and Government Affairs Committee, my name is Lindene Patton. I am employed by a U.S. subsidiary of the Zurich Insurance Group (the Group) and serve as the Chief Climate Product Officer for the Group.

Zurich is a global insurance company providing insurance and risk management solutions to customers in 170 countries. It has been serving customers in the United States since 1912, and today stands as the third largest commercial property-casualty insurer in the country, with over 8,000 employees nationwide.

I would like to begin my testimony by thanking you for holding this timely hearing. I look forward to sharing with the Committee an insurance industry perspective on the current state of our nation's resilience to extreme weather events and the economic importance of investing today in improving resilience.

Zurich observes that the US is increasingly reliant on disaster recovery funding to respond to extreme weather events[1] and underinvested in resilience – physically[2] and economically[3].

Zurich maintains that insurance has a unique capacity to facilitate resilience like no other financial instrument. Insurance provides risk assessment, risk management and risk-based price signals – all of which help signal risk magnitude and risk reduction priorities to stakeholders. To reduce reliance on disaster recovery funding, increased collaboration with insurers and reliance on risk based price signals will be required because the insurance mechanism is the best indicator of risk that the market economy can provide.

Future improvements to our nation's resiliency require coordinated risk management involving the best tools government and insurers have available.

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[1] "Federal Financial Exposure to Natural Catastrophe Risk" J.David Cummins, Michael Suher, and George Zanjani (2010), corrected

[2] http://www.infrastructurereportcard.org/a/browser-options/downloads/2013-Report-Card.pdf
American Society for Civil Engineers (ASCE) March 2013, Report Card for America's Infrastructure.

[3] Id Cummins and BIS Working PapersNo 394 , Unmitigated disasters? New evidence on the macroeconomic cost of natural catastrophes by Goetz von Peter, Sebastian von Dahlen, Sweta Saxena , Monetary and Economic Department December 2012
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Assuring resilience to extreme weather events requires risk management before, during and after a loss event. If our response to extreme weather events is only after they occur, society has squandered its best opportunity to control risks and costs related to these events, creating an unmanaged, unbudgeted exposure.

Zurich's mission is to help our customers understand and protect themselves from risk. Our business philosophy is centered on planning for risks, and assuring the capacity and capability to respond to both the expected and unexpected extreme event. Zurich understands the importance of pre-event investments in resilience, and therefore, acts accordingly by committing time and money to support resilience initiatives for our company, our customers and the communities where we work and serve. We are very proud of our efforts and to give context, some examples of actions taken by Zurich to share knowledge with stakeholders on improving resilience of assets and of direct Zurich investments in improved resilience include:

- Since 2007, Zurich has through a formal initiative explored risk management issues relating to the role of insurance in society in providing economic resiliency, education, pre-event risk reduction and disaster management training, and post-event loss mitigation .
- In 2008, Zurich announced, as part of its global climate initiative, that it would dedicate significant resources and apply its skills in the area of risk management to assist stakeholders in adapting to and mitigating the risks of climate change. As one example of related activities, since 2011 Zurich has allowed me to accept a personal appointment to the US National Climate Assessment to share expertise and knowledge to further the understanding of the state of the science related to severe weather events and needed resilience. Many other examples exist.
- Since 2009, Zurich has been instrumental in the work of the World Economic Forum assessing and evaluating the inter-connectedness of risk through development and issuance of the Global Risk Report [4] ; the Global Risk Report provides insights into the importance of extreme weather interconnectedness to key economic functionalities in global society, affirming the importance of risk mitigation to minimize negative economic disruption and other consequences. This work highlights that physical resilience to extreme weather events is

[4] The latest Global Risk Report can be found at http://www.weforum.org/reports/global-risks-2014-report; "the *Global Risks 2014* report highlights how global risks are not only interconnected, but also have systemic impacts. To manage global risks effectively and build resilience to their impacts, better efforts are needed to understand, measure and foresee the evolution of interdependencies between risks, supplementing traditional risk-management tools with new concepts designed for uncertain environments "

inextricably interconnected to economic stability (or instability where resilience is insufficient or deteriorates).

- In 2010, Zurich developed its Supply Chain Insurance and Risk Management Services program for insureds. This program was specifically designed to assist customers to evaluate risks to their supply chain, identify vulnerabilities, prioritize responses and set up physical, operational and financial risk management systems to address those risks so that when disaster strikes, including extreme weather events, global and local risks are managed so that business continuity is achieved and business proceeds with minimal disruption. Today only 8% of businesses have business continuity programs with their suppliers according to the Business Continuity Institute (BCI); BCI further notes that approximately 40% of disruptions are caused by severe weather events.[5]
- In 2011 Zurich worked with the World Economic Forum to research, write and publish "A Vision for Managing Natural Disaster Risk", which focused on the importance of public private partnerships to achieving resilience for communities, rather than just individual assets.
- In 2012 Zurich launched its flood resilience initiative in conjunction with the International Federation of Red Crescent (the Red Cross). Through this program, we seek to demonstrate the benefits of pre-event risk reduction over post-event disaster relief, and improve public dialogue around flood resilience on the ground.
- In March 2013, we announced that we will enhance our existing cooperation with the International Federation of Red Cross and Red Crescent Societies (IFRC) with a commitment of up to CHF 21 million over five years. Together with the IFRC and Red Cross national societies, Zurich is putting in place community flood resilience programs in both urban and rural settings, starting in Mexico and Indonesia. These two programs will serve as models for future efforts that build on our risk engineering and analytical skills, and complement the on-the-ground knowledge and experience of the IFRC. In these countries we are also testing ways to measure community flood resilience against key indicators.
- In the Gulf Region, Zurich has worked closely with public officials and the private sector to improve resilience and economic sustainability in New Orleans. Activities from this resilience initiative have been consistent, numerous and varied, ranging from working with Habitat for Humanity to building storm resistant homes to improved disaster response to ongoing economic investment. As an example, in response to Katrina, our longstanding partnership

[5] Business Continuity Institute Survey, November 2013

in the St. Bernard Project[6] a non-profit organization established in March 2006 to rebuild homes destroyed by Hurricane Katrina.

- In 2013, the St Bernard Project was expanded to support activities for post-Sandy rebuilding. As part of Zurich's and its employees' commitment to rebuilding communities and helping to restore local economies following natural disasters, Zurich formed an alliance with St. Bernard Project and Tunnel to Towers. To date, Zurich employees have donated more than 2,000 volunteer hours to rebuild homes on Staten Island, helping rebuild 14 homes impacted by Sandy. In late July, the company announced a $165,000 grant to St. Bernard Project to hire client services manager, a volunteer program manager and a construction site supervisor to support the rebuilding of an additional 60 Staten Island homes over the next year
- Over the years we have worked with progressive customers like Marriott to both demonstrate by design and implement cost beneficial extreme weather event risk mitigation solutions. For example, Marriott had one hotel that was damaged by hurricanes three times – Hurricanes Frances, Jean and Wilma – over a 12 month period in 2004 and 2005. We worked with Marriott to evaluate capital investment options for rebuilding with improved resilience; culminating in Marriott's upgrading of the facility to a Zurich Highly Protected risk (HPR) wind standard that reduced the predicted maximum probable loss (PML) exposure by $135 million USD for a modest increase of capital investment of orders of magnitude less than the projected PML reduction.
- In 2013, Zurich worked with Verizon to address post-Sandy repairs and future facility extreme weather risk mitigation in Lower Manhattan; Zurich Risk Engineers and Underwriters collaborated with Verizon to design flood barrier walls, water intrusion barriers, and other facility retrofits to assure that when extreme weather occurs, risks of damage and service interruption from flood waters is eliminated or reduced to the levels of maximum expected probable loss.
- Zurichhas supported the Institute for Building and Home Safety (IBHS) for years. Our support is focused on the study of commercial building resilience to wind, water, fire, and hail, committing hundreds of thousands per annum to research. In 2013 Zurich committed an additional $1 million USD to research and sits on the Research Advisory Board for IBHS supporting its one of a kind testing facility in South Carolina.

[6] www.**stbernardproject**.org

- Zurich, through IBHS and directly in kind, has been active supporters of the Department of Homeland Security (DHS) 'Resilience Star' pilot[7] - a pilot which Zurich believes should be extended from its current residential scope to include both commercial and community applications.
- In 2013, Zurich announced a commitment to purchase $1 Billion USD of green bonds focused on resilience from a program managed by the World Bank[8], making Zurich a global leader in the purchase of such resilience supporting instruments. This innovative capital investment is focused on pro-active risk mitigation and adaptation to extreme weather events and is precisely the type of focused, directed, and purpose qualified capital investment, backed by the full faith and credit of a AAA rated institution that is required institutional capital at scale in sufficient amounts to close the resilience gap (e.g. improve community and asset resilience to extreme weather events to improve economic and social resiliency of communities.)

This work and the work of the larger insurance industry on risk management techniques may provide models for closing the current resilience gap.

## Roadmap to Resilience

My testimony will cover five aspects of understanding and improving our nation's resilience to extreme weather:

First, defining the extreme weather resilience gap;

Second, assessing the magnitude of the extreme weather resilience gap. Extreme Weather will cause economic disruption today and exponentially more economic disruption and other consequences in the future unless affirmative steps are taken to change this risk-accretive trajectory;

Third, the potential for the Insurance sector to provide valuable tools, skills, expertise and information, that are neither currently being effectively deployed nor leveraged to help society manage extreme weather risks and losses;

Fourth, the Federal Government has a significant ongoing role in disaster preparedness and recovery, that could be optimized through better coordination and collaboration with the insurance industry; and, finally,

[7] https://www.disastersafety.org/resiliencestar
[8] http://www.zurich.com/media/newsreleases/2013/2013-1118-01.htm

Finally, the concrete steps in the short term, medium term and long term that, if taken, would begin to close the resiliency gap, including but not limited to:

- the promotion of government and private investment in infrastructure resilience;
- the development of government policies and programs that send risk-based price signals;
- the elimination of government policies and programs that distort insurance markets;
- the education of society on the true costs of extreme weather events and the personal and community economic benefits of improved resilience; and
- the promotion and enforcement of stronger building codes.

## Point 1: There is an extreme weather resilience gap

Currently in the United States, many privately and publicly held assets, from homes to critical infrastructure, are not sufficiently "resilient" to withstand extreme weather events.

The Department of Homeland Security defines resilience as '…*the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies*.' The Department notes that a '*major component of resilience is the capacity of society's assets or its built environment to withstand or quickly recover from weather-related catastrophes*…'

The World Bank defines resilience as '…*the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate to, and recover from the effects of hazard in a timely manner, including through the preservation and restoration of its essential basic structures and functions*'. (Dickson, et. al, 2012).

Irrespective of which definition is applied, in the case of extreme weather events, significant assets and communities in the United States are not sufficiently resilient[9].

[9] Appropriations request post Katrina Emergency Supplemental Appropriations for Hurricane Katrina Relief August 22, 2006 - RS22239; PL 109-62; 109-148; 109-174; 109-234; Sandy Relief PL 113-2 and others. The WEF Global Risk Report (Id.) cites extreme weather as one of the top ten global risks of concern.

One only need read the newspapers to affirm that in the face of named storms and other extreme events, large numbers of assets, and the communities that are defined by these assets and which support them, are not sufficiently resilient. Current risk management systems,-engineering tools, land use policies, public and private insurance uptake and or disaster aid are not sufficient to incentivize or create asset resilience nor to facilitate rapid restoration of the asset and resiliency after an extreme weather event. Impacts of catastrophes, especially economic impacts, are not limited to single structures, dwellings or families, but are rather impacting entire communities and regions.

Look to the Gulf Coast, the coastal regions of New York and New Jersey – or to the Central Plains – and you will find individuals and communities that have not recovered months and in many cases years after an extreme weather event. In fact, in the US, the Business Continuity Institute (BCI) found that 45% of supply chain disruptions were caused by extreme weather events. BCI found that approximately 40% of businesses that were impacted by extreme events such as hurricanes for extended periods of time never recovered and never reopened. Thus, existing risk management systems and *ex post* disaster recovery efforts were not sufficient to restore all assets and communities or to restore them to a position where they would be more resilient in the face of future extreme weather events, which will be exacerbated by climate change. This and similar experiences illustrate the findings of the Bank of International Settlements Study[10] which states:

> ***"…Our main results are that major natural catastrophes have large and significant negative effects on economic activity, both on impact and over the longer run. However, it is mainly the uninsured losses that drive the subsequent macroeconomic cost, whereas sufficiently insured events are inconsequential in terms of foregone output.*** This result helps to disentangle conflicting findings in the literature, and puts the focus on risk transfer mechanisms to help mitigate the macroeconomic costs of natural catastrophes." (emphasis added)

A recent economics research paper confirmed through analysis that droughts and floods slow economic growth, thus affirming the importance of investment in resilience to extreme weather events. The European Commission Environment for Science newsletter summarized the report findings as follows:

> "Droughts and floods can significantly damage economic growth, recent research has found. A 1% increase in the area affected by drought can slow a country's gross domestic product (GDP) growth by 2.7% per year and a 1% increase in the area experiencing extreme rainfall can reduce GDP growth by 1.8%, according to the study.

[10] BIS Working Papers No 394 , Unmitigated disasters? New evidence on the macroeconomic cost of natural catastrophes by Goetz von Peter, Sebastian von Dahlen, Sweta Saxena , Monetary and Economic Department December 2012

Investments in water security could help reduce this negative economic impact, say the researchers."[11]

## Point 2: The magnitude of the resilience gap is sufficient to cause short, medium and long term economic disruption today and more so in the future unless affirmative steps are taken to change this risk-accretive trajectory

The resilience gap is large. How large? In 2010, Professor Cummins and co-authors projected that costs for the federal government share of unfunded disaster response costs for weather related disasters would grow to amounts within the range of the unfunded social security benefits over the same time horizon of 75 years: unfunded social security benefits are estimated to be approximately $4.7 Trillion USD; and unfunded federal disaster assistance costs are estimated to range between $1T USD and $5.7T USD (all figures adjusted to 2008 dollars).[12] Cummins, et al. estimate that the special appropriations required to address federal disaster response costs to extreme weather events will range from $1B USD for low loss years to $100B per annum in 2008 dollars for high loss years[13].

Unfunded exposures of the *state* catastrophe funds are in addition to this number[14]. The magnitude of state exposure from state natural catastrophe funds was estimated by the Government Accounting Office in a 20120 report at about $3T USD[15].

Another recent report found that both the frequency and magnitude of federal disaster relief for events causing loss in excess of $1B USD is increasing at a significant rate and that federal disaster relief expenditures alone (which excludes supplementary charitable, state and local costs) over the last 3 years have risen to $400 per household – more than a four-fold increase over the past 30 years[16].

[11] http://ec.europa.eu/environment/integration/research/newsalert/pdf/359na1.pdf citing Casey Brown, Robyn Meeks, Yonas Ghile and Kenneth Hnu, "Is water security necessary ? An empirical analysis of the effects of climate hazards on national-level economic growth", Phil. Trans. R. Soc. A2013 317, 20120416, published September 2013.
[12]. "Federal Financial Exposure to Natural Catastrophe Risk" J.David Cummins, Michael Suher, and George Zanjani (2010), Corrected page 62 para 3
[13] Id. Cummins page 62 at para 3
[14] Id. Cummins (2010) page 62 para. 3.
[15] Reports citing Citing GAO-10-568R Natural Catastrophe Insurance Coverage GAO 2010 at http://www.hawaiireporter.com/hurricane-sandy-pacific-tsunami-scare-expose-state-catastrophe-debts/123; http://www.statebudgetsolutions.org/blog/detail/hurricane-sandy-tsunami-scare-expose-state-catastrophe-debts
[16] "Disastrous Spending: Federal Disaster-Relief Expenditures Rise Amid More Extreme Weather", Daniel J. Weiss and Jackie Weidman, 29 April 2013 at http://www.americanprogress.org/wp-content/uploads/2013/04/WeissDisasterSpending-1.pdf.

The US Government Accountability Office has also found these exposures to be of sufficient magnitude to warrant inclusion in the High Risk Series[17].

Munich Re NatCatSERVICE data show that the number of loss-relevant weather catastrophes has increased significantly since 1980, globally and in North America[18]. In North America, the annual average number of natural catastrophe events (primarily, weather-related) has risen by four fold, from 50 to 200 in the last 30 years.[19] Even disregarding 2005 (a record year with Hurricanes Katrina, Rita and Wilma), overall and insured losses (adjusted for inflation) reveal an upward trend in the past three decades[20] – calculated before the Superstorm Sandy event. The rate of increase of the average number of annual natural catastrophe events (primarily, weather-related) in the United States is faster than the global rate of increase of 2.5 – based on an increase from 400 events in the 1980s to 1000 events in recent years.[21]

While taxpayers are bearing the burden of this increasingly unbudgeted risk and associated loss costs, some experts have suggested that the current approach to disaster funding may be unintentionally creating a 'stealth entitlement'[22]. From an insurers' perspective, this would manifest as an inhibitor for demand for our risk management products and services – a market distortion.

Without decisive risk reduction and management action by those tasked with managing risk – local, state and federal governments, as well as insurers, economically unsustainable accretive unbudgeted disaster management costs are projected to[23] continue on an upward trajectory.

This is not a concern unique to the United States. The European Union is currently struggling with these very issues and has recently issued a study on point called the EU Green Paper[24] .The EU Greenpaper notes:

> "… Even where costs of major disasters are locally concentrated, if costs are inadequately covered by insurance then individual Member States may carry large fiscal burdens, which could cause internal and external imbalances." Noting further at page 12, section 3.0 "…Building resilience is a long-term effort that needs to be integrated in national policies and planning: resilience strategies are also part of the development

[17] See **GAO-13-283 High-Risk Series**
[18] Munich Re, "Severe Weather In North America", Knowledge Series, 2012, page 22.
[19] Id. at 19, Figure 3.
[20] Id. at 22.
[21] Id. at 19.
[22] For a longer discussion on the concept of 'stealth entitlement' and natural catastrophe response costs, see "Federal Financial Exposure to Natural Catastrophe Risk," J. David Cummins, Michael Suher, and George Zanjani (2010).

[23]

"Federal Financial Exposure to Natural Catastrophe Risk" J.David Cummins, Michael Suher, and George Zanjani (2010), Corrected page 62 para 3

[24] EUROPEAN COMMISSION Strasbourg, 16.4.2013 COM(2013) 213 final **GREEN PAPER on the insurance of natural and man-made disasters**

process and contribute to different long-term policies, in particular climate change adaptation and food security."

The pattern of extreme weather event frequency and severity is predictable according to academics and other experts; and this science forms the basis for our industry's natural catastrophe modeling and underwriting processes. These predictive modeling processes are today the backbone of the underwriting standards for natural catastrophe and allow insurers to properly price risk. In addition to forming the foundation for pricing insured risk, the science related to extreme weather events suggests that a foundation for budgeting for resilience investments with a better return on investment might be defined from this predictable cash flow demand, as I discuss further in Point 5 of my testimony. In addition to industry proprietary models, open source platforms may be available to assist communities in such predictions in the not so distant future.[25]

## Point 3: Insurance has valuable data and analysis, tools and expertise that when leveraged to their greatest efficient capacity can help society manage these extreme weather risks and losses; disaster recovery funding is not a functional equivalent to insurance for these characteristics

The fundamental function of insurance is risk pooling. Insurance also provides a number of other critical functions that benefit individuals and society: risk assessment, risk management and risk pricing; and general social welfare value through security[26]. Today, insurance is not being fully leveraged to solve the unfunded severe weather resilience gap.

For example, insurers use risk assessment, risk management and risk pricing data to inform customers about risks, consequences and options for resilience investments so they can take action to protect their assets. One of many examples of this service is the offering of Strategic Risk Management Solutions (SRM) by Zurich for its customers in 2008[27]. Part of SRM services includes the Total Risk Profile (TRP) tool which applies a risk identification methodology – in advance of loss to predict potential exposures and identify mitigation options . SRM even quantifies the risk so you can prioritize budget spending to fix the most impactful issues. Zurich

[25] https://connect.innovateuk.org/web/oasis-open-access-catastrophe-model.
[26] Zurich Role of Insurance in Society and Economic Development http://zdownload.zurich.com/main/reports/What_is_the_role_of_economic_developement.pdf; http://www.zurich.com/internet/main/SiteCollectionDocuments/insight/social-and-economic-value.pdf
[27] See Appendix 1 Zurich SRM brochure.

applied SRM TRP post-Sandy for a food supplier. Application of the TRP tool revealed that there was only one route through which a large portion of NYC food passes and the impact magnitude of the route interruption was great, so alternative route development proceeded to mitigate risk. Local governments and individual citizens may not have access to such information and may default to dependency on disaster recovery money rather than loss avoidance or mitigation through advance planning or investment.

Some may believe that *ex-post* disaster recovery funding takes the place of insurance. *Ex-post* disaster recovery funding is neither equivalent in function nor speed to private insurance[28]. One of the critical differences is that disaster recovery funds typically are delivered more slowly than insurance payments. The result is a slower recovery and even longer term negative economic impacts[29].

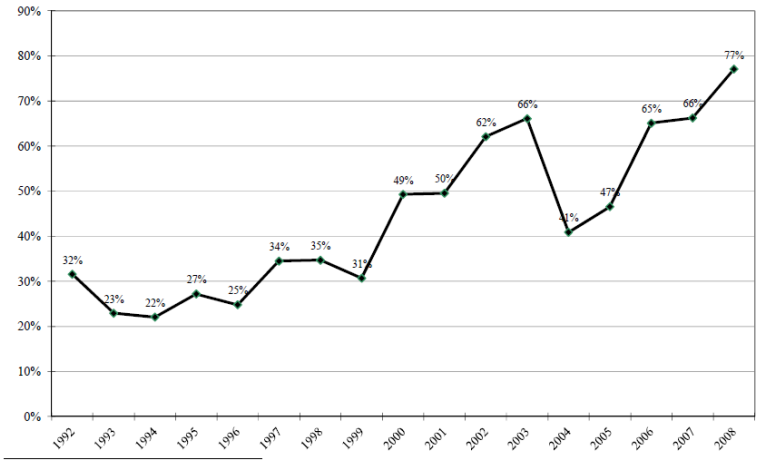
Trends suggest some in society are now shunning private insurance because of the expected availability of government-funded disaster relief. The uninsured and underinsured are deciding to rely on perceptively lower cost *ex-post* financed disaster recovery mechanisms - but with concomitant lower economic functionality. This trend includes state and local governments in addition to individuals[30].

This trend does not support economic resilience in the face of extreme events. In fact uninsured and underinsured economies are more likely to suffer long term macro-economic damage[31]. The financial reality of this ill-advised short term expense trade (e.g. avoiding premium payments) is long term negative economic productivity impacts[32]. Whether the asset

[28] BIS Working Papers No 394 , Unmitigated disasters? New evidence on the macroeconomic cost of natural catastrophes by Goetz von Peter, Sebastian von Dahlen, Sweta Saxena , Monetary and Economic Department December 2012

[29] Id

**Figure 4: Ratio of Total Federal Government Disaster Expenditures to Measured Losses**
Source: Cummins, Suher, and Zanjani (2010)[2]




[30]

[31] Id. BIS

[32] Id. BIS

owner has chosen public insurance with artificially capitated limits or disaster recovery mechanisms in lieu of private insurance, the impact of this choice does not often 'hit home', so to speak, until disaster strikes[33].

A recent report prepared by the Insurance Information Institute and provided to the Federal Disaster Recovery Coordination Group confirmed that the substitution of private insurance with *ex-post* financed structures did not result in equivalent economic outcomes and provided the following observations[34]:

> (1) homeowners, renters and small business owners need to understand the importance of purchasing flood insurance. There also needs to be greater education about what is and is not covered under a flood insurance policy;
>
> (2) There was widespread confusion on the role of deductibles in an insurance policy and even more misunderstanding regarding wind and hurricane deductibles;
>
> (3) Homeowners and renters did not understand their overall coverage and their various insurance options;
>
> (4) Claimants need to have a better understanding of how the claims process works before there is a disaster; and
>
> (5) Some businesses did not understand their coverages either.

The above -cited report notes that individuals did not understand what was insured, uninsured and / or how disaster response funds might be available – or not – to help their personal recovery[35].

Disaster aid is prioritized to address government function and services first; private assets are addressed as a secondary priority at best.

By contrast, insurance is a contract agreement governed by its terms, conditions and applicable law focused on the individual insured and their assets. Insurance is an on-going business, structured with *ex-ante* funds with a consistent administration in constant operation and procedures to assure efficient and timely administration to meet its obligations.

Disaster aid is generally episodic, unplanned and dependent upon *ex-post* special appropriations. Disaster aid must be distributed through a system which may be designed *ex-*

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[33] http://www.wnyc.org/articles/wnyc-news/2013/apr/30/sandy-damage-prompts-some-to-walk-away-instead-of-stay/ ; http://news.yahoo.com/six-months-hurricane-sandy-much-still-175600302.html; and Id BIS.
[34] http://www.iii.org/assets/docs/pdf/Sandy-042413.pdf.
[35] http://www.iii.org/assets/docs/pdf/Sandy-042413.pdf.

*ante* but which is only activated *ex-post* on an infrequent basis leading to concomitant start up delays.

The key strategic question is two-fold – can insurance play a role in accelerating the transition of insufficiently resilient-state assets to assets that meet underwriting criteria AND provide a stable, predictable, affordable risk management tool to society on a long-term basis?

Traditional insurance theory and proved applications suggest the answer is **yes** .

However, for insurance to play a substantial role in improving societal resilience to extreme weather events the following conditions must be in place: deployment of insurance must occur through collaborative public-private partnerships which address moral hazard mitigation and stem uncontrollable risk accretion by retaining the function of risk-based price signals to incentivize risk reduction on the part of risk creators.

Where net present value (NPV) mitigation investment opportunities exist with private insurance, deploying insurance would have *ex post* welfare enhancement value.[36] As one example, Zurich's work with Marriott has demonstrated the benefits of extreme weather event mitigation with minimal costs for wind protection and water resilience. "Upgrading to Zurich's HPR wind standard reduced the WIND PML (Probable Maximum Loss) potential by $135 million," said Senior Risk Consultant Dale Seemans.

A major complication in assessing the welfare value of insurance is the interaction between four factors – increasing severity of the catastrophes, the rising trend of governmental aid, the substitution of government insurance for private insurance and the incentive of homeowners and the government itself not to mitigate[37].

The real world value of the risk reduction incentive created by the *ex ante* insurance approach is significantly greater than the pure short-term cost efficiency offered by an *ex post* financing theory because it addresses what economists call moral hazard[38].

Thus, by their very nature, private insurance and government sponsored disaster aid are different. Neither the power of private insurance nor government sponsored disaster aid can be fully leveraged in isolation. Maximum leverage of these resources arises only in cases of partnership and collaboration[39]. This public-private partnership as discussed below is the only

[36] Jaffe, Geneva Association papers., 2013 (1-26) Page 15 The Welfare Economics of Catastrophic Losses and Insurance, Dwight Jaffee and Thomas Russell identify four dependencies: insurable interest, "leaky bucket" frictional cost transfer inefficiencies for government disbursements, mandatory building codes commensurate with risk mitigation and other incentives for ex-ante risk mitigation..
[37] Jaffe, Geneva Association papers., 2013 (1-26) Page 2 The Welfare Economics of Catastrophic Losses and Insurance..
[38] BIS working paper 394; "A Vision for Managing Natural Disaster Risk, World Economic Forum April 2012, p 67.
[39] "A Vision for Managing Natural Disaster Risk", World Economic Forum April 2011 section 7.3.

way to leverage both activities to achieve long term, consistent resilience in the face of natural catastrophe, especially as exacerbated by climate change.

## Point 4: Government has a current and ongoing role in disaster preparedness and recovery that could be significantly enhanced through better collaboration with the insurance industry;

Government has an important and ongoing role in both disaster preparedness and disaster recovery. However, preparedness includes investments in pre-loss mitigation and regulation incentivizing prudent risk management behaviors on the part of communities.

Government should provide a systematic approach to risk reduction through national and regional plans that coordinate multiple stakeholders to bring about the necessary solutions[40]. Such plans need to be enabled by appropriate legislative and administrative frameworks which:

- Encourage and facilitate greater investment in pre-loss mitigation and improved infrastructure resilience;
- Promote and support transparent risk-based price signals;
- Address disadvantaged or at risk population with vouchers rather than hidden cross subsidy[41];
- Promote and enable national minimum building codes and standards by conditioning federal matching funds on resiliency criteria;
- Clearly communicate priorities and limitations of disaster response and recovery so that citizens can make educated decisions about insurance and other risk management decision taking.[42]

Current trends and studies suggest that more pre-loss mitigation expenditure would improve the return on the taxpayer investment in catastrophe-prone areas.

Governmental policies also need to be adjusted to achieve these ends. For example, building codes must be adjusted to be responsive to the extreme weather exposures of today and those

[40] Id.
[41] "Addressing Affordability in the National Flood Insurance Program", *Issue Brief*, Carolyn Kousky and Howard Kunreuther, *jointly published by Resources for the Future and the Wharton Risk Management and Decision Processes Center, August 2013.*
[42] http://www.iii.org/assets/docs/pdf/Sandy-042413.pdf.

projected for the future, consistent with the expected useful life of the asset to be built or remodeled. This would assure that new and modified building stock was resilient during its expected useful life (upon which society relies for many economic calculations) and would leave only pre-existing building stock and assets as potentially inadequately resilient.

Such pre-loss mitigation expenses are exceptionally cost efficient providing a minimum of a 4:1 return on investment[43].

Insurance also can be leveraged to promote resilience in building. Insurers can require that assets be repaired or rebuilt after a loss event to the new sufficiently resilient building code. This approach "smooths in resilience" and assures that when the next extreme weather event strikes that the assets and communities are more resilient and less likely to experience repeat losses. This breaking of the cycle benefits residents, communities, governments, and business.

## Point 5: There are immediate short term, medium term and long term actions that should be taken to close the resiliency gap, including but not limited to the promotion and enforcement of stronger building codes; promotion of investment in resilience; and support for and requirement of risk-based price signals.

Should resilience investment be prioritized over disaster response costs ?

Absolutely. Why ?

Investment in Resilience:

1. Saves Taxpayers billions of dollars annually – this a cost effective investment that will save local, state and federal governments billions of dollars.
2. Provides greater protection to the public in the face of increasing extreme weather events, reducing human suffering.

[43] *Multihazard Mitigation Council (MMC),* "NATURAL HAZARD MITIGATION SAVES: An Independent Study to Assess the Future Savings from Mitigation Activities", National Institute of Building Sciences (2005).

3. Reduces business interruption and overall economic impacts of extreme weather events; and

4. Creates domestic jobs and promotes domestic manufacturing in building more resilient housing and infrastructure

Studies affirm the value of pre-loss risk mitigation investment in reducing extreme weather and climate-related risk. In fact, one study claims a conservative 4:1 return on investment for risk mitigation (adaptation) investments[44]. Others have estimated a greater than 10 to 1 return so even 10% would be extremely valuable. Assuming the investments could ensure long term resilience, avoided losses should be discernible within a budget cycle reflecting the return rate of extreme events after completion of the first projects whether those projects are bricks and mortar or policy reforms - noting that the implementation of policy reforms may actually take longer in some cases than brick and mortar projects.

What should be done to improve resilience?

First, government could provide a systematic approach to risk reduction through national and regional plans that coordinate multiple stakeholders to bring about the necessary solutions[45]. Adoption of a non-proprietary tool like the proprietary Zurich Total Risk Profile Tool would be beneficial. Before risk reduction strategy can be developed, a national priority plan must be developed. Much research about asset vulnerability exists, but a framework in which to evaluate and prioritize it does not. Development of this risk reduction prioritization framework, perhaps through the GAO may be a good vehicle for this.

Actions Congress could take to improve resilience might include:

1. Use the language of the Extreme Weather Title of the Water Resources Development Act as an example of what could be applied to improve the resilience requirements framing the hundreds of billions of dollars the federal government invests annually in water, port, highway, transit and aviation infrastructure.

2. Expand the Resilience Star pilot currently proceeding at DHS to include commercial applications and most importantly entire community resilience ratings. The IBHS Fortified Building Standard is integral to the Resilience STAR pilot. The Resilience Star initiative could be a game changer for dealing with community resilience. The pilot establishes the business case for becoming resilient and takes a return on investment

[44] *Multihazard Mitigation Council (MMC)*, "NATURAL HAZARD MITIGATION SAVES: An Independent Study to Assess the Future Savings from Mitigation Activities", National Institute of Building Sciences (2005).
[45] "A Vision for Managing Natural Disaster Risk, World Economic Forum April 2012

approach. This approach should stimulate the market and create consumer demand for resilience. Individuals and businesses will realize benefits. This a a great example of a concerted collaborative public private effort to help build the Nation's resilience which should be expanded and supported. Given the interconnectedness of risks and impacts from extreme weather, extension of this currently limited residential home pilot to the improvement of entire community networks is essential to achievement of real extreme weather resilience. Through such an effort, the federal government could take a proactive leadership approach to promote the economic resilience of entire communities in the face of extreme weather.

Simultaneously, private and community resources should supply information on what individuals and communities can do to improve resilience. Regionally targeted assessments should be made to assess resilience of community, and resilience fact sheets should be prepared and distributed to insufficiently resilient populations. Given the combination of recent trends in drought and wildfire and the continued migration of greater populations to the wilderness urban interface (WUI), the need for this action will become increasingly urgent over time.

This information already exists in some cases, but in many cases it must be developed. Insurers have some information but by no means all if the information necessary to assess resilience needs and alternatives. Further, insurers do not develop this knowledge as part of their current business operations as many of these risks are not assumed by private insurers, but have been assumed by the government either through government insurance programs or by default as a disaster response provider.

Economic resources to perform such vulnerability assessments and for related responsive capital investments in resilience might be derived from the amount of special appropriations predicted by Cummins. It is also logical to take a portion of that predictable special appropriations demand and use it to improve resilience in assets.

How much should be budgeted?

From a practical perspective, funding resilience is a fundamentally wiser investment than spending on disaster relief and recovery. As previously noted, the Multihazard Mitigation Council found that funding resilience provides a 4:1 return on investment – reductions in future

costs of relief and recovery. Between 2011 and 2013, the US Government spent approximately $136 billion USD on disaster relief and recovery[46]. If during this same three (3) year period the federal government had proactively budgeted and amount equal to 25% of those funds, approximately $34 billion USD, and dedicated that amount to prioritize resilience investments, then approximately $136 billion USD of future disaster relief and recovery costs could be avoided over the return rate of the extreme event cycle. As the incidence and costs to the federal government of extreme weather events increase so does the budget imperative to make greater investments in resilience.

Theoretically the determination of the appropriate amount for investment in resiliency should be based upon a technical assessment of a local and regional basis of vulnerability to extreme weather events, current resiliency conditions for vulnerable assets, and prioritization using a cost / benefit analysis framework. But, in the end, the amount of vulnerability that can be reduced will be bounded by the practical reality of the federal budget – and prioritization will need to be made with a temporal component.

Immediate, concrete and responsible actions, including increased capital investment in resilience is essential to maintain economic sustainability in the face of extreme weather events and climate change.

## Conclusion

ZURICH believes that we have an opportunity to dramatically improve the resilience of our nation's homes, businesses and critical infrastructure and that this can be achieved in a manner that will ultimately save federal, state and local governments billions of dollars annually while providing citizens greater protection from extreme weather events. Seizing this opportunity will require:

- Extensive collaboration between the insurance industry and the federal government to provide needed incentives for improved resilience;
- Elimination of government policies and programs at the federal, state and local levels that provide perverse disincentives to improved resilience;
- Investment by local, state, and federal governments in enhanced infrastructure resilience measures;

[46] "Disastrous Spending: Federal Disaster-Relief Expenditures Rise Amid More Extreme Weather", Daniel J. Weiss and Jackie Weidman, 29 April 2013 at http://www.americanprogress.org/wp-content/uploads/2013/04/WeissDisasterSpending-1.pdf.

- Investment by businesses and homeowners in enhanced resilience measures

On the ground behavioral changes, shaped by government policies, in conjunction with increased investment in resilience and risk management must occur in order reverse the current trajectory of unbudgeted federal disaster expenditures. .

I hope my testimony has provided the Committee with a greater understanding of:

(1) the economic value Zurich sees in resilience investments;

(2) why Zurich believes more investments in improved resilience should be made today across regions of the nation with assets and people at elevated risk to extreme weather events; and

(3) how Zurich thinks investments in improved resilience might be balanced with funding for disaster relief and recovery to maximize the economic impact of finite federal funds.

Zurich is extremely encouraged by the Committee's efforts to improve resilience and develop sustainable communities in the face of extreme weather events. Zurich looks forward to working with the bipartisan leadership of the Committee to perfect the innovative climate change adaptation tools of the future.