



Human Factors: Green Jobs & Resident Health

Better Buildings Summit

May 10, 2016

11:15-12:30 PM



U.S. DEPARTMENT OF
ENERGY

Today's Presenters



Ruth Ann Norton
Green & Healthy
Homes Initiative



Erika Symmonds
GRID Alternatives





How Energy Efficiency is Improving Health, Economic, and Social Outcomes

Ruth Ann Norton

Green Jobs & Resident Health

How Energy Efficiency is Improving Health, Economic and Social Outcomes

Ruth Ann Norton

President and CEO

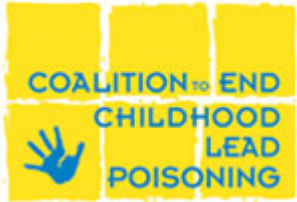
May 10, 2016

Better Buildings Challenge Summit

Our Mission

*To break the link between
unhealthy housing and unhealthy children*

Green & Healthy Homes Initiative – our history



1986

Volunteer Effort

Parents Against Lead



1993

Coalition to End
Childhood Lead Poisoning



2009

Became the
Green & Healthy
Homes Initiative

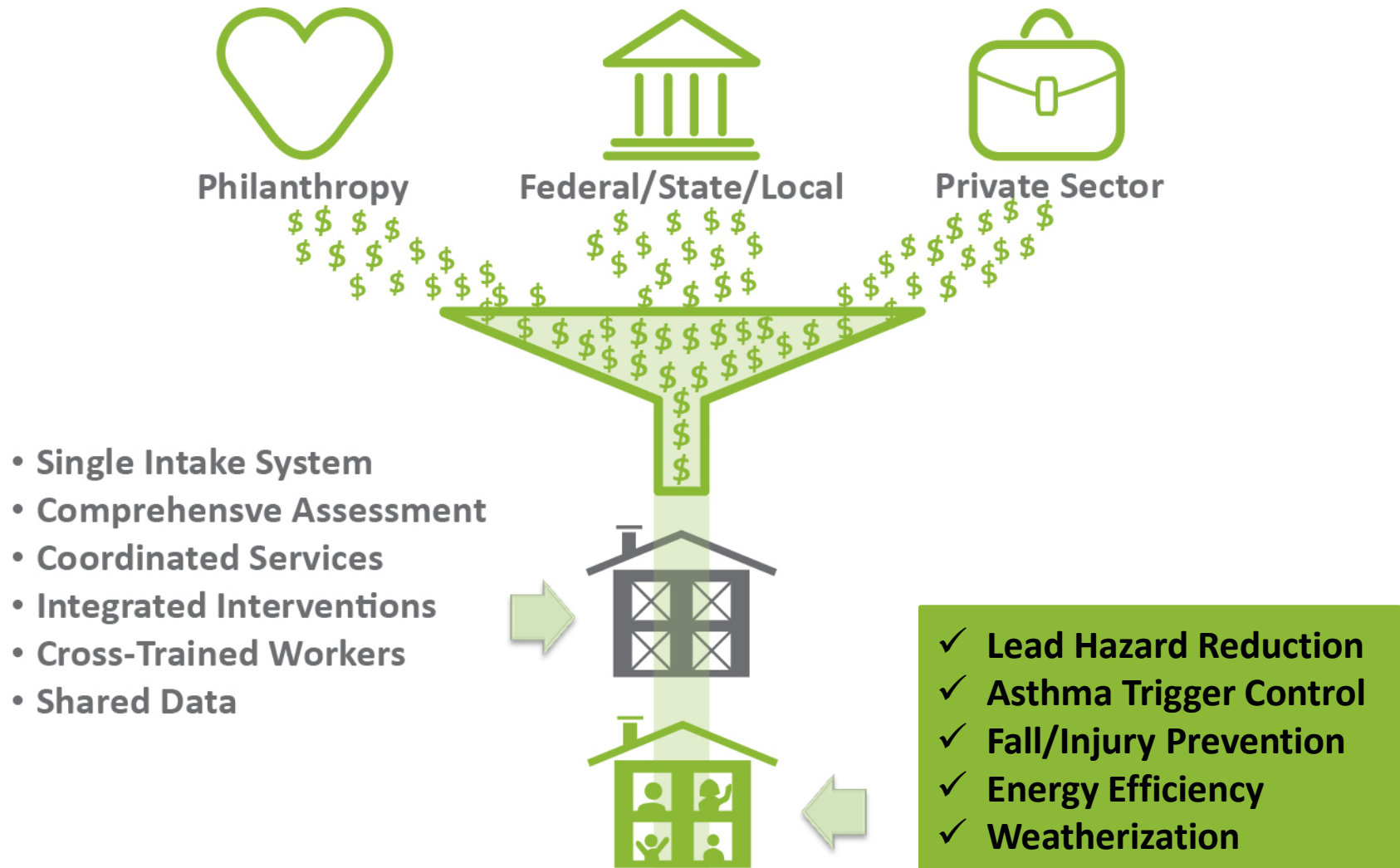


**Green & Healthy
Homes Initiative®**

Accomplishments

- Designed the efforts for the 98% reduction of lead poisoning in Maryland
- 30 successful lead poisoning prevention legislative measures
- First Housing Choice Voucher Program for Lead
- 25 GHHI sites working to address lead through holistic housing approach
- Over \$300 million raised to eradicate lead and other environmental health threats

The GHHI “No Wrong Door” Model



GHHI Model - Cross Trained Inspectors and Contractors

- Healthy Home Evaluator (HHE) Credential
http://www.bpi.org/professionals_hhe.aspx
- Cross Training of Contractors and Inspectors From Multiple Fields to Increase Ability to Deliver Comprehensive Interventions
- Increased Contractor and Inspector Capacity
- Development of Green Trades Accreditation
- Job Training and Economic Development for Residents of Low Income Communities



BPI Healthy Homes Evaluator Micro-credential

- Developed by the Building Performance Institute, Green & Healthy Homes Initiative (GHHI) and other key partners in the field
- Released in April 2016
- Cross training energy auditors on home-based environmental health hazard assessment, scope writing and intervention best practice protocols
- Supports the further integration nationally of Healthy Homes interventions with weatherization/energy efficiency intervention funding streams



The Need and the Opportunities for the new BPI Healthy Homes Evaluator Credential

- A. New Local Procurement Requirements
- B. Comprehensive Green & Healthy Homes Approach
- C. Innovative Funding Sources
- D. Pay For Success/Social Impact Bonds
- E. Other Emerging Markets (Aging in Place, Private Market Demand)

Comprehensive Housing Interventions

Health & Safety	Green / Energy Efficiency
Asthma Trigger Reduction	Energy Audit
Lead Hazard Reduction	Weatherization
Health & Safety Assessment	Insulation
Integrated Pest Management	Reducing Air Infiltration & Leakage
Trip & Fall Risk Reduction	Venting
Fire & Injury Prevention Measures	Remediating Gas Leaks & CO
Health & Safety Education	Energy Efficiency Education
Mold Remediation	

Integrated Interventions and Non Energy Benefits

Leverage funding to address environmental health hazards and energy loss leads to greater Non-Energy Benefits:

- Fire and Carbon Monoxide Safety
- Reduced Environmental Toxins
- Reduced Thermal Stress
- Better Indoor Air Quality
- Improved Health Outcomes
- Economic Stability



Financial burden of unhealthy housing

Nine Million families live in unhealthy homes

Costing Taxpayers Billions Annually

- \$19B = trip and fall injuries for seniors
- \$43.4B = lead poisoning
- \$50.1B = asthma

- 40% of emergency department visits and hospitalizations for asthma are caused by unhealthy housing conditions such as extreme heat and cold and poor indoor air quality

Asthma

- 25 million Americans with current asthma diagnosis including 6.8 million children
- Asthma rates are increasing annually
- 1 in 10 children and 1 in 12 adults have asthma
- 3,500 asthma related deaths annually
- Asthma accounts for over 15 million doctor visits, and nearly 2 million ER visits each year
- 14.4 million missed school days from asthma
- 14.2 million missed work days from asthma

Health impact and benefits of GHHI

- Impact on asthma:
 - 67% reduction in asthma-related client hospitalizations
 - 28-60% reduction in asthma ER visits
 - 50% increase in participants never having to visit the doctor's office due to asthma episodes
 - 62% increase in participants reporting asthma-related perfect attendance for their child (0 school absences due to asthma episodes)
 - 85% increase in participants reporting never having to miss a day of work due to their child's asthma episodes
 - Major reduction in housing turnover: 6% versus 36% Annually
- Peer-reviewed and published in Environmental Justice Journal

Evidence: National Evaluation of the Weatherization Assistance Program

- ORNL ARRA study (2010) estimated present value Energy Savings of \$3,190 and including Non-Energy Benefits for a Total Savings of \$13,167 per Weatherized Home with average Total Cost of \$6,812
- SIR of 0.9 Energy Benefits compared to Total Savings/Total Cost with Return on Investment of 1.93
- Reduced asthma symptoms: ED visits and hospitalizations
- Reduced thermal stress
- Reduced CO poisonings and fire mortality
- Improved mental & physical health
- Budget issues (utility, food, medical, housing, etc.) reduced post-weatherization. Important connection between budget problems and ‘trade-off’ in dealing with health and other priorities
- Improved school and work attendance

GHHI National Outcomes

Over 510,000 GHHI influenced green and healthy units

- Integration of weatherization/energy efficiency with Healthy Homes, lead hazard reduction, and housing rehabilitation
- \$400 to \$700 average annual reduction of energy costs
- 20% decrease in costs to government programs
- Cornell/CEO Buffalo Study: \$4K - \$8K increase in wages
- GHHI standards recommended by US Conference of Mayors and Federal Interagency Work Group on Healthy Housing

Family Outcomes

Veal Family – 612 Curley Street

Pre-Intervention Situation:

- Allergens (mold, mice, VOCs, poor IAQ)
- Significant lead hazards in the home
- Poorly weatherized but deferred by WAP Program
- Malfunctioning furnace – Heating with kitchen stove
- 2 children w/asthma – Hospitalizations/missed school days

Interventions: New furnace (Constellation Energy); Weatherization (City WAP); Lead Hazard Control (CECLP HUD); Moisture Control/Mold (CECLP HUD, Foundations); Healthy Homes (CECLP HUD/CDBG); Client Pre-Post Education (CECLP, Hopkins)

Intervention Cost: \$18,780 **Integrated Approach Savings:** \$2,958

Outcomes:

- ✓ No repeat hospitalizations or missed school days due to asthma episodes
- ✓ Lower energy and maintenance costs
- ✓ Youngest child's school performance has improved from being a "C" student to an "A" student post intervention

Family Outcomes

Smith Family - 5004 Alhambra Avenue

Pre-Intervention Situation:

- Family of four with a son who has severe asthma
- History of repeated asthma episodes resulting in hospitalizations on average of three times per year since birth (Average stay: 1 week)
- Deteriorated, lead hazardous windows; high dust mite levels; mouse infestation; lack of venting; high VOC usage; poorly weatherized

Costs: \$12,256 – GHHI Savings \$2,159

Partners: HUD OLHCHH, MEA, CDBG, CSBG, Foundations

Results: Allergens and lead hazards remediated; Home weatherized

Outcomes:

- Son was not hospitalized due to asthma triggers in the home in the 12 months post-intervention
- Annual energy cost savings of \$721
- **Avoided medical costs of \$48,300 in first year alone**

New Avenues for Funding

- Medicaid Reimbursement
- Public Service Commission Funds
- AG Settlement Funds
- Hospital Community Benefit Funds
- Pay for Success

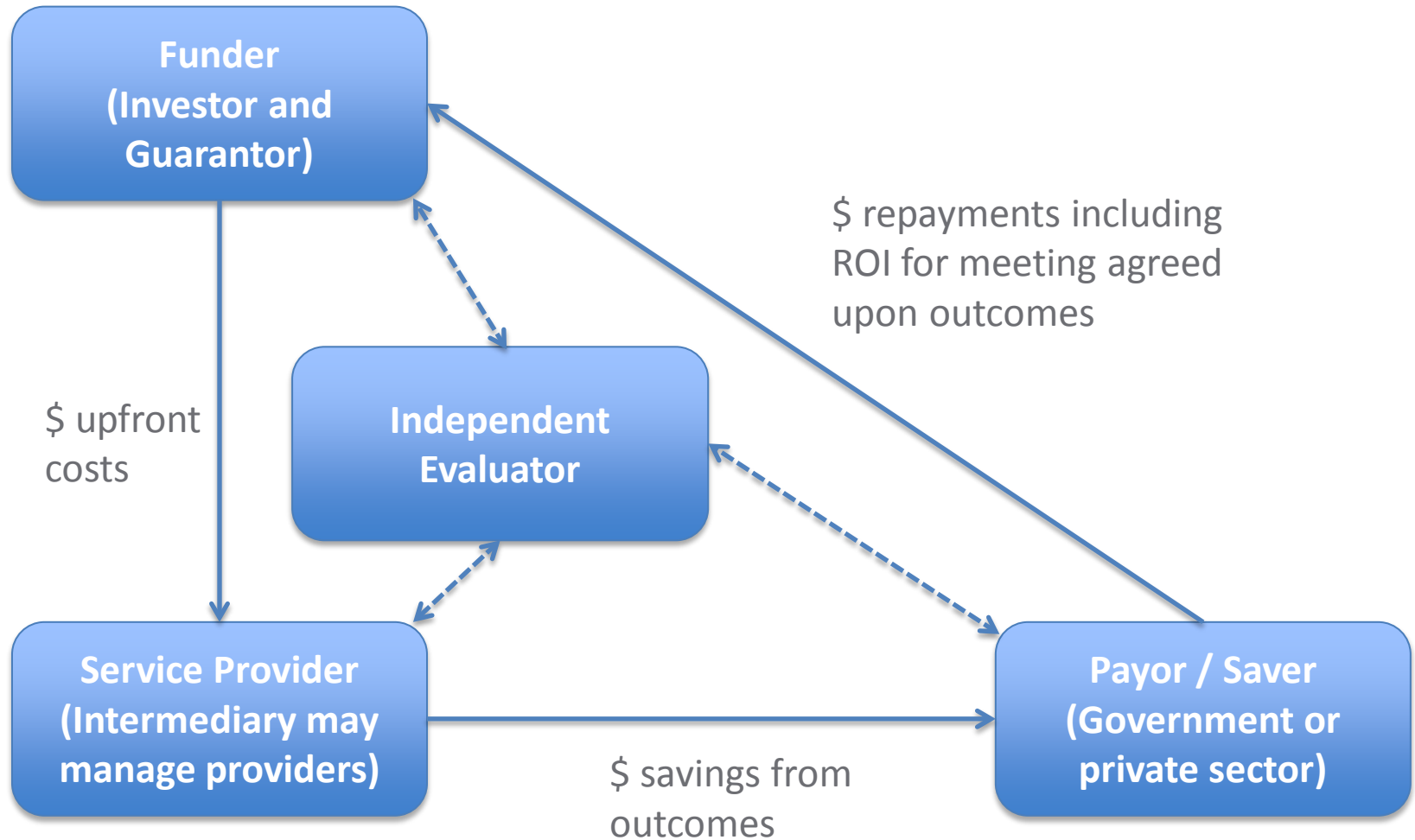
Hospital Community Benefit Investments

- Community Benefits traditionally used for uncompensated care
- AHA reported in 2010 that hospitals provided benefits valued at over 11% of expenses, with uncompensated care and financial assistance to patients averaging 5.7%. Adding in health professions education and medical research brought this up to 8.2%.
- VT has state requirements for non-profit hospitals
- “Community building activities” only made up 0.1-1% nationally



Pay For Success / Social Impact Bonds

3 asthma projects developing – Fresno, Alameda, and Baltimore



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Generating Healthier Communities: Leveraging Solar Energy to Improve Individual, Community, and Environmental Health

Erika Symmonds



Generating Healthier Communities

Leveraging Solar Energy to Improve Individual,
Community, and Environmental Health

www.gridalternatives.org



GRID's Vision and Mission



Vision: A successful transition to clean energy that includes everyone

Mission: Make renewable energy technology and job training accessible to underserved communities

People. Planet. Employment.

People

Economic Empowerment



Planet

Environmental Justice



Employment

Workforce Development





Who is GRID?



GRID Alternatives is a non-profit solar installer.

Our work is made possible by:

- Volunteers
- Homeowners
- Strategic Partnerships





Renewables and Energy Efficiency

- 1. Greater EE means less RE deployed**
- 2. Renewables lend themselves to distributed generation – less lost in transmission**
- 3. No combustion by-products like wasted heat**
- 4. EE and RE are encouraged as a combined package for decreasing the energy waste and carbon production of buildings.**



GRID's Growing Impact



6,659
Systems
Installed



22,796 kW
Installed



178 M in
Long-
Term
Savings



25,885
Volunteers
Trained



503,147
tons GHG
prevented



GRID Alternatives History



2001: Founded by Erica Mackie and Tim Sears

2004: First install – San Francisco, California

2005- 2011: Expanded to 7 California offices, serving the entire state

2012: Expanded to Colorado

2013: Expanded to New York Tri-State region

2014: Expanded to Mid-Atlantic region and Nicaragua

2015: Launched RISE Initiative and expanded National Tribal Program





Solar Affordable Housing Program

GRID Provides:

- PV System Funding
- System Design/Engineering
- Building Permits
- Installation
- Utility Interconnection
- Energy Efficiency audit & referrals
- Client education & follow-up
 - 10 year labor warranty
 - 10-25 year equipment warranty
- Workforce development





Programmatic Work

- Single-Family
- Multi-Family
- SolarCorps Fellowships
- Tribal Program
- Solar Spring Break
- International Program



Workforce Development at GRID

GRID has trained
over 25,000
volunteers in
hands-on solar
installation



- Realizing an Inclusive Solar Economy (RISE)
- Women in Solar (WIS)
- Troops to Solar
- Solar Futures





Health Benefits of Solar: Healthier People

- Low income solar programs like GRID's offer savings to those who can greatly benefit
- Less money spent on utilities can mean more money to spend on other needs – like healthcare
- Low income communities are disproportionately negatively impacted by traditional power generation



Health Benefits of Solar: Healthier Planet

Solar electricity production has no associated air pollution emissions.

GRID alone has prevented over 500,000 tons of GHGs

Air and water pollution from coal and gas plants is linked to

- Breathing problems
- Neurological damage
- Heart attacks
- Cancer

The Impact of Employment on Health

Unemployment may affect health in many ways.
Laid-off workers are⁵:



54% more likely to have fair or poor health.



83% more likely to develop a stress-related condition such as heart disease.

Unemployment has also been linked to⁶:



Loss of Health Insurance



Increased Stress & Blood Pressure



Unhealthy Coping Behaviors



Increased Depression



Stable Jobs, Healthier Communities

Unemployment impacts communities.

- Increased risk of mortality was associated with higher neighborhood unemployment rates (van Lenthe, Borrell, Costa, Diez, Roux, Kauppinen, et al., 2005).
- In addition to engaging in riskier health behavior...the long-term unemployed may be induced to seek out work in the illegal sector (Urban Institute, 2013)

The solar industry added workers at a rate nearly 12 times faster than the overall economy in 2015

- Accounted for 1.2% of all jobs created in the US in 2015
- Employs over 200,000 workers
- 2015 annual growth rate of 20% (3rd consecutive year of 20% growth)

Table 16. Median Hourly Wage, 2014-2015

Occupation	Median Hourly Wage (2014)	Median Hourly Wage (2015)
National Median Hourly Wage⁸⁴	\$ 17.09	
Installer	\$ 20.00	\$ 21.00
Sales Representative	\$ 28.85	\$ 28.85
Solar Designer	\$ 26.00	\$ 26.92
Assembly Worker	\$ 15.00	\$ 18.00

Source: *The Solar Foundation, 2016*

On average, solar jobs pay higher than the national median hourly wage



...For Good People





What is Workforce Development at GRID?

RISE - 5 R's

- Recruitment
- Real-world Experience
- Readiness
- Referral
- Retention

Who We Work With



GRID works with:

- Individuals
- Job training organizations
- Community colleges.





Individuals and groups from Job Training Organizations have access to:

- Volunteer experience, skills check-off, leadership pathways
- Real hands-on experience doing single-family homes, multi-family, and utility style installations
- Workshops related to different aspects of solar careers



Organization Spotlight: Green City Force (GCF)



GCF partners with GRID to provide hands-on training and exposure to solar for young NYC public housing residents that benefits underserved communities.

GCF Corps members are exposed to

- educational sessions on solar power
- site visits to assess rooftops for solar
- two-day install
- intro to design





Organization Spotlight: Proteus, Inc.

Proteus is one of GRID's most successful job training partners, with more Proteus trainees finding employment in the solar industry than any other partner.

Proteus pairs GRID's hands-on experience with their classroom-based training





Organization Spotlight: Homeboy Industries

Program in LA for formerly gang-involved and recently incarcerated men and women.

Participants in the PV training program receive classroom training from East Los Angeles Skills Center and hands-on training with GRID.

Close to 1,000 clients have been serviced since Homeboy began. The program graduates over 92% of its candidates with a 70% placement rate within 90 days of graduation.





Viking Village, Fresno CA, 2015

- In partnership with Fresno Housing Authority
- 16.7 kW system
- 18 housing authority residents and family members participated in install
- **Resident engagement on EE and Green Jobs**



Check our low income solar policy guide!

LowIncomeSolar.org
#SolarforAll

www.gridalternatives.org



Thank you!

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Director of Workforce Development

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Discussion