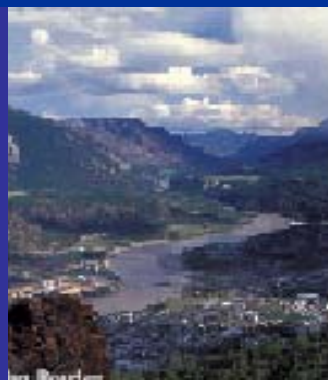




# Reducing Emissions from Woodstoves

Annual BVLD Clean Air Plan Review and Air Quality Forum  
June 15, 2006

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# Overview

- Why are woodstoves a concern?
- What have we done?
- Community Based Social Marketing
- Questionnaire and Focus Group Results
- US Experience
- Future

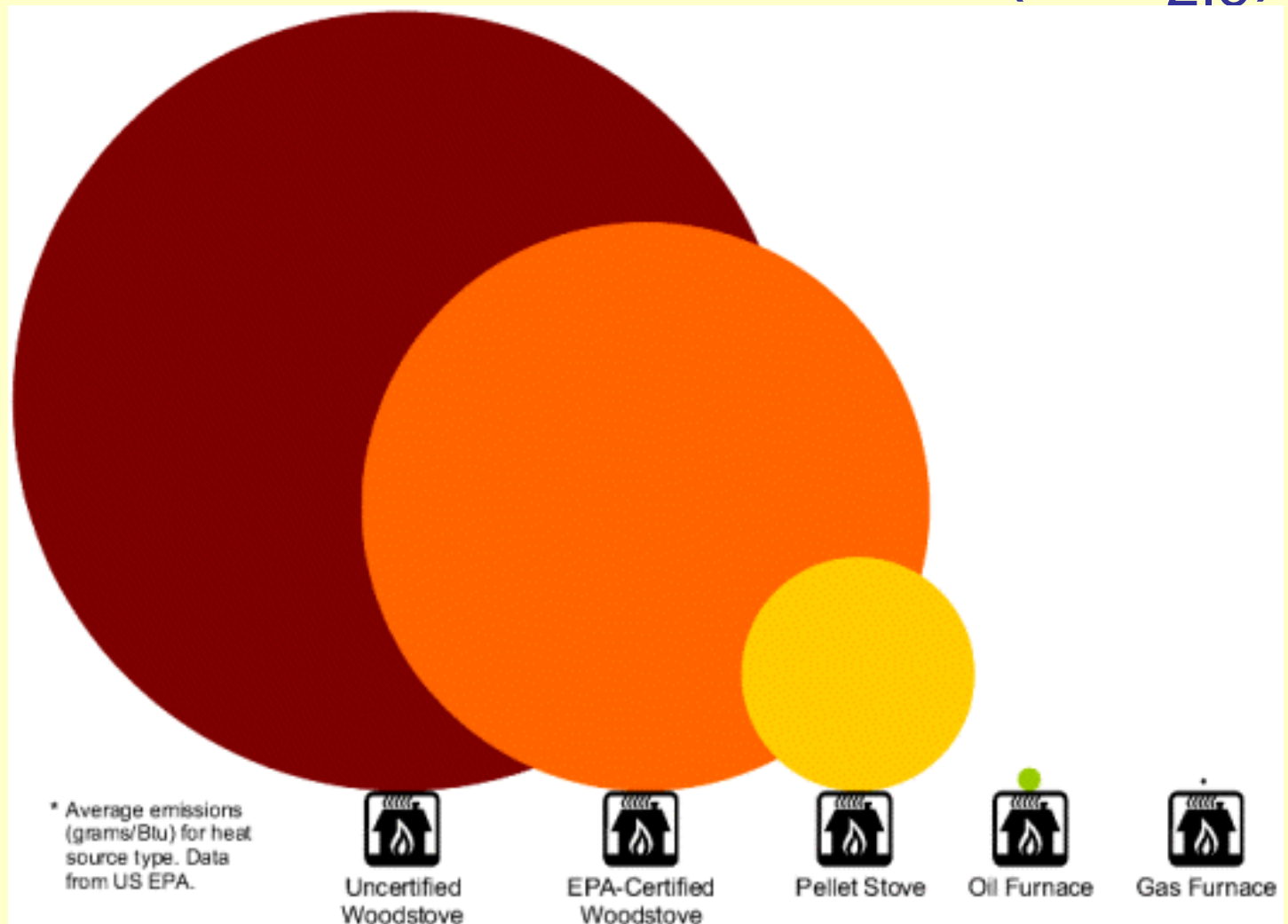


# BVLD Plan - Chapter 8

- 11,500 homes in the study area
- 7,200 are heated with wood
- 4,200 of which are conventional (non-US EPA certified)
- 8% of annual  $PM_{2.5}$  – more during the heating season, and emissions are released where people live



# Relative Fine Particulate (PM<sub>2.5</sub>)





# What have we done?

## Solid Fuel Burning Domestic Appliance Regulation

On or before November 1, 1994 -  
manufacturer, wholesaler or retailer  
must not sell for use or for resale an  
appliance unless it meets U.S. EPA or  
CSA emission standards





# What have we done (cont'd)

## Burn-it-Smart Workshops

	2003	2004
• Burns Lake	14	9
• Terrace	13	16
• Smithers	25	13
• Houston	19	0
• Hazelton	6	-
• Stewart	10	-

# What have we done (cont'd)

## 2004 Skeena-BVLD Wood Stove Exchange Program

35 stoves changed out



# What have we done (cont'd)

## Provincial Programs

1995 BC	213
2001/2/3/4/5 Okanagan	677
2004 BVLD	35
2002/3/5 Cariboo	180
2004 Columbia-Kootenay	58
2004/5 Golden	44
2005 Sunshine Coast	17
2004 Prince George	17
Total	1241

# How many non-certified?

Provincial telephone survey 2003  
indicates\* 51% of household wood  
burning appliances are old technology:

67,500 conventional woodstoves

16,900 conventional inserts

\* BC excluding LFV and Kelowna



# Community Based Social Marketing

...based upon research that demonstrates that behavior change is most effectively achieved through initiatives delivered at the community level which focus on removing barriers to an activity while simultaneously enhancing the activities benefits.



# CBSM steps

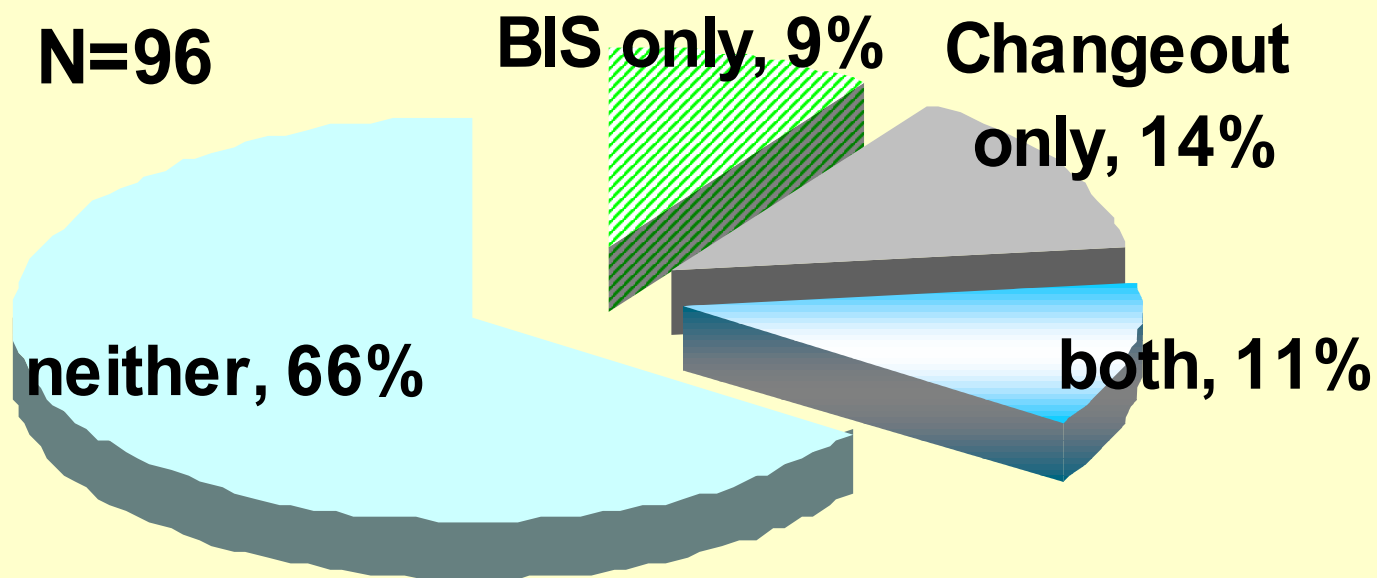
1. Identify barriers and benefits to an activity
2. Develop a strategy that utilizes tools that have been shown to be effective
3. Pilot the strategy
4. Evaluate that strategy once it has been implemented across a community



# CBSM

- Questionnaire – Smithers
  - *Focus groups – Burns Lake, Terrace, and Smithers*
- } Step 1
- Results are still preliminary – a consultant is writing up the report.

# Previous Program Awareness



BIS = 2003 Burn-it-Smart Workshop

Changeout = 2004 Skeena-BVLD Woodstove Exchange

# *Attitudes toward Wood Smoke*

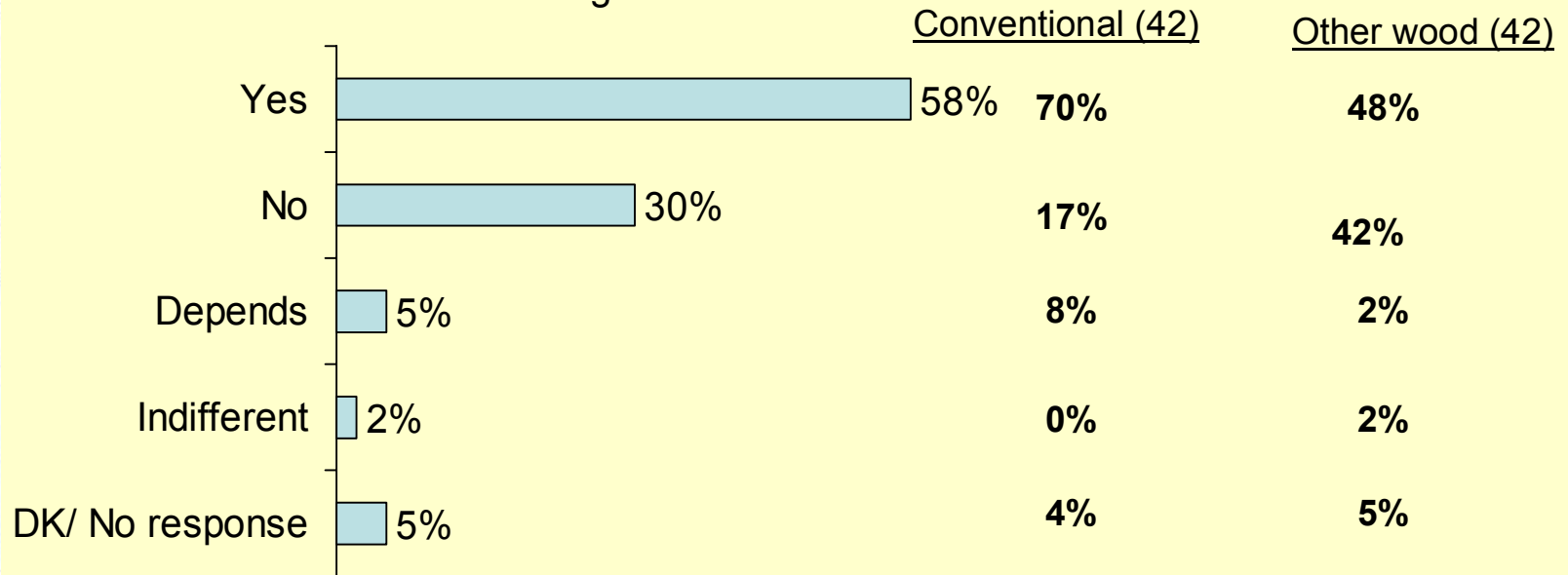
- Wood smoke is not considered a major contributor to air pollution. Industry and cars are believed to be causing most of the pollution*
- Bulkley Valley is considered to have better air quality than most parts of BC*
- Wood smoke is not offensive to most as long as the wood is dry and no garbage or other materials have been added to the fire*
- Perceptions of wood smoke in the community varies across the Valley:*
  - Terrace and Burns Lake are sometimes smoky but not that often*
  - Smithers is often smoky beginning in fall and ending in spring*
  - Rural areas are less smoky than neighbourhoods closer to town*





# Attitudes toward Wood Smoke (cont'd)

26. Do you like the smell of wood smoke in general?



Base: All respondents, N=129

# *Conventional Appliance Types*

- The RSF (Renewable Solid Fuel) made in Smithers Model 65 and 85 are most common*
- Others: Blaze Kings, Kozi Komforts, Woodchief and Fisher Mama Bear*
- Several unaware of brand as it was in the house when they moved in*



# *Plans to Upgrade*

- *Approximately half of the residents we spoke with are considering upgrading to a new technology stove*
  - *Efficiency is the main reason (new stoves heat quickly, are very warm, and use half of the wood required by the conventional stoves)*
  - *Air quality is only a minor concern in the decision to upgrade*
- *Interest in replacing with gas and electricity is low*



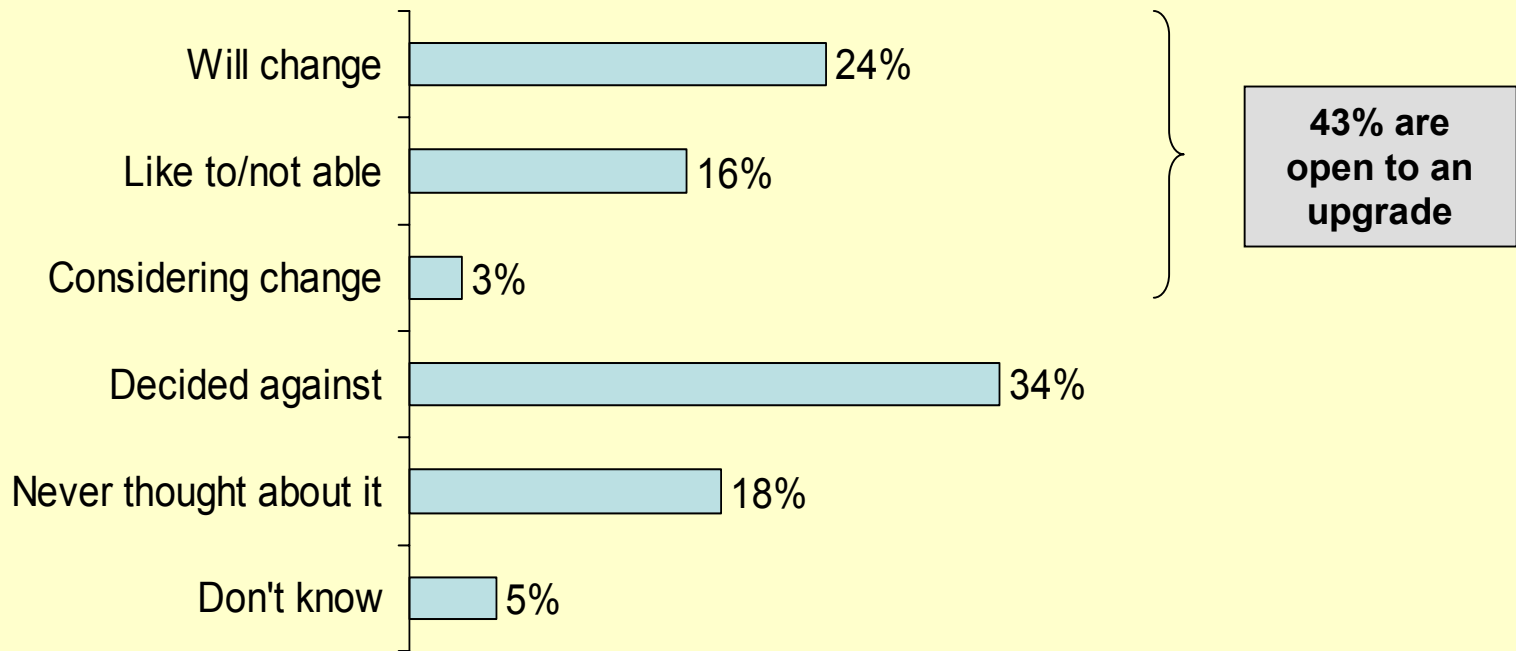
# ***Barriers to Switching to New Technology***

- Cost is, by far, the most common barrier to purchasing a new technology wood stove.*
- Belief that older stoves are efficient and the technology cannot be improved.*
- Financial incentives would encourage an upgrade to a new technology stove. Buy-back/ exchange programs, government grants, and tax refunds are mentioned as appealing financial incentives.*



# Plans to add or switch

65. Do you have any plans to add a new heating appliance or switch to another heat source in the near future?



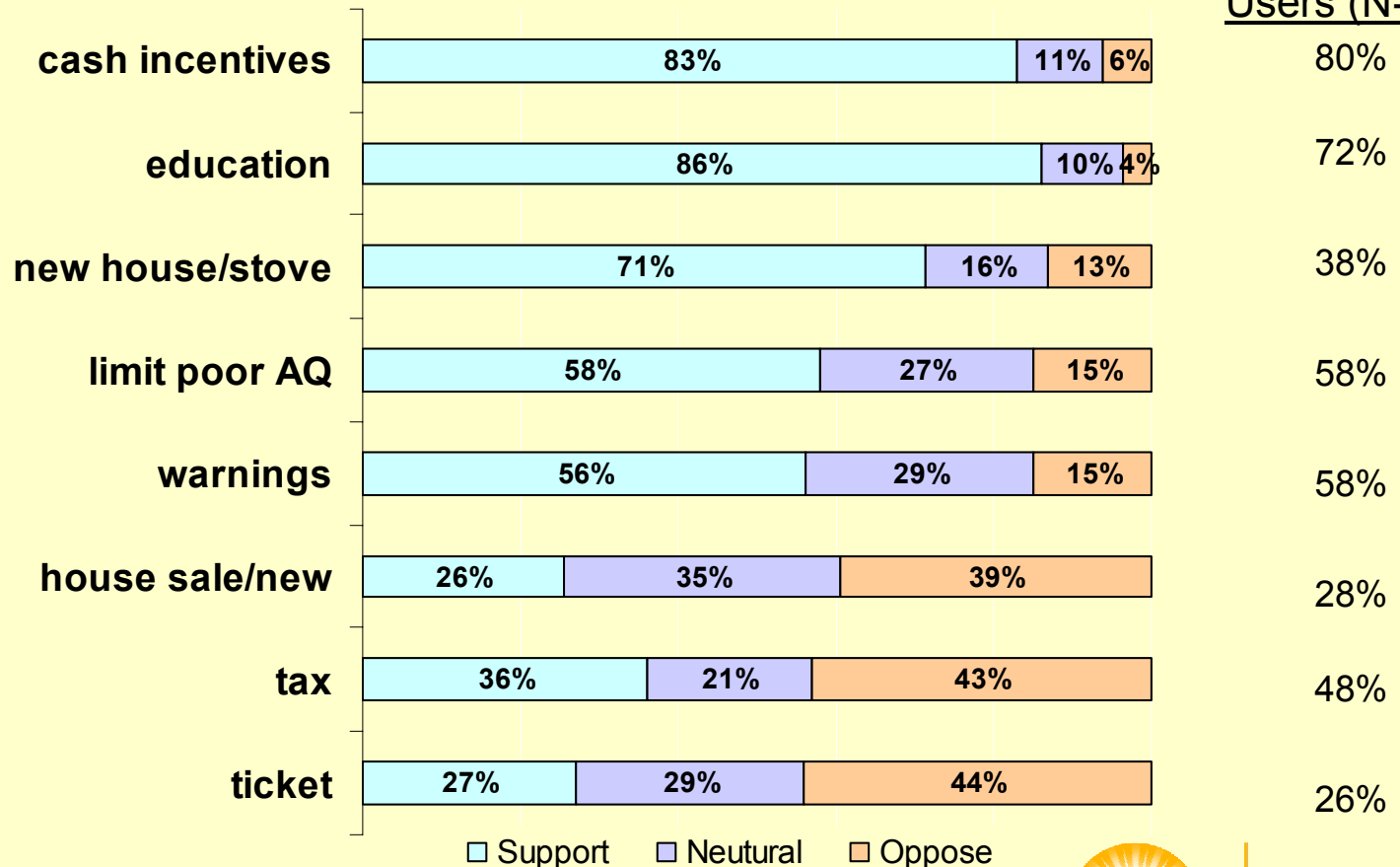
Base: Respondents using conventional stoves, N=45



# Support/Opposition to Actions

All (N=127)

Conventional  
Stove  
Users (N=51)



**2006 survey results weight adjusted using 2003 random survey**



**Ministry of  
Environment**

# *Reaction to By-Laws*

- *People raised concerns such as:*
  - *Difficult to implement*
  - *May not be effective to reduce wood smoke*
  - *Concern for residents who rely solely on wood heat*
  - *Penalizes people who cannot afford it*
  - *By-laws represent a loss of community control*
- *Analogy to “gun registry” – group agreement*
- *Point to the need for communication when implementing a bylaw*
- *Education aspect of by-laws received a positive response – i.e. visit when lots of chimney smoke*



# *Reaction to By-Laws*

## *Smithers*

- “I heard bylaws are coming in but they won’t only apply to woodstove users”*
- More awareness that air pollution issues have to be addressed*
- Same concerns raised for wood only users, but the general response was more cooperative*



# Health Air Quality Message

Wood smoke contains many toxic pollutants. Several studies have related wood smoke to respiratory (lung) symptoms such as coughing, asthma, congestion, and wheezing. In British Columbia, air pollution is estimated to account for 25 to 250 deaths per year, and costs our health care system \$85 million per year. Health risks are higher for pregnant women, children, elders and those with existing heart and lung problems.

Air quality in Smithers/Hazelton/Telkwa is negatively affected by residential wood smoke. The provincial health officer has recommended that action be taken to reduce wood smoke emissions.

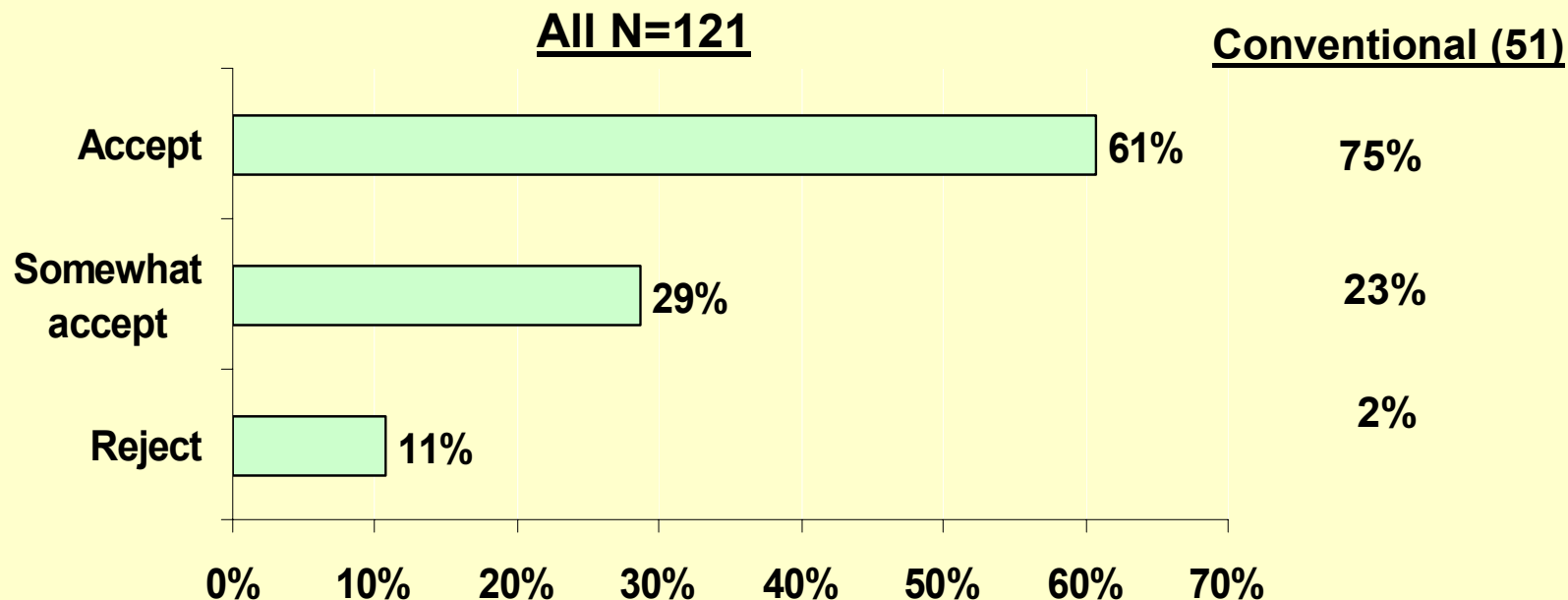
Old woodstoves release far more air pollution than other forms of residential heating.



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Environment

# Health Message Acceptance

## Do you accept these facts?



**Results weighted to BVLD using 2003 random woodstove survey**





# *Health Message Acceptance*

*The communication statements about wood smoke and health risks were not well received and not considered credible by most.*

- Facts are familiar and accepted but the link to wood smoke is not believable*

# *Wood smoke message*

- Genuine concern about deaths and health risks*
- Overall, not credible and thought to be a “scare tactic”*
- Not credible that wood smoke is causing the deaths, or costing the healthcare system money directly or indirectly*



# *Air Quality message*

- Considered exaggerated because wood smoke is less of a problem than other polluters such as industry*
- Health officer not credible - part of the government and Victoria*
- Health officer is targeting woodstove users rather than industry*



# CBSM Summary

- Education and changeouts to date have not been all that effective
- There is a low level of awareness for past BIS and change out activities
- Over 60% of households like the smell of wood smoke
- Just under half of conventional wood users indicated a desire to change out
- Concerns raised for bylaws – Smithers generally more cooperative
- Health message was generally believed in the survey but not in the focus groups

# US Experience

## Libby Montana

- Goal: Replace 1200 stoves by 2007
- Budget of over \$2 Million – includes comprehensive monitoring and final report
- Phase I – Low income ~150 installed
- Phase II – 470 applications
- Regulation being finalized Jan 07 no uncertified appliances





# Darrington Washington

- 500 Households – 35% use wood (under represented)
- Incentives:
  - \$2500 propane, oil or electric
  - \$1500 pellet
  - \$500 certified wood
- 28 applications since Nov '05
- No regulatory conditions



# Crested Butte Colorado

- Stove discounts up to \$800
- Town ordinance to remove. If don't comply pay \$30/mo for 3 years.
- 1988-89
  - 349 conventional
  - 85 certified
- Summer/Fall changeout program



# Crested Butte - results

- 1989-90
  - 68 conventional
  - 276 certified
- 281 conventional removed, 191 certified installed
- Emission testing - average certified emit 67% less PM than conventional

# Future

## Continue with this work



# Future (cont'd)

- Health messaging needs improvement
- Consultant report on questionnaire and focus groups being prepared
- Continue to work with health products and other stakeholders
- Develop strategy for pilot changeout and education – CBSM Step 2
- Test pilot with community – CBSM Step 3



# Future (cont'd)

- A pilot changeout program in the Skeena Hwy 16 corridor is likely
- Bylaw component is important for success – based on US experience
- Pilot would be evaluated – CBSM Step 4
- Results of this work would be used to shape changeout and education programs in other parts of the province

# References

- B.C. Solid Fuel Burning Domestic Appliance Regulation  
[http://www.qp.gov.bc.ca/statreg/reg/E/EnvMgmt/302\\_94.htm](http://www.qp.gov.bc.ca/statreg/reg/E/EnvMgmt/302_94.htm)
- Burn-it-Smart <http://www.burnitsmart.org/>
- US EPA Woodstove information  
<http://www.epa.gov/woodstoves/>
- California Wood Burning Handbook  
[http://www.arb.ca.gov/cap/handbooks/wood\\_burning\\_handbook.pdf](http://www.arb.ca.gov/cap/handbooks/wood_burning_handbook.pdf)
- Residential Wood Burning Emissions in British Columbia (2003 Random Survey)  
[http://www.env.gov.bc.ca/air/airquality/pdfs/wood\\_emissions.pdf](http://www.env.gov.bc.ca/air/airquality/pdfs/wood_emissions.pdf)