Mother Earth Recycling Presentation
City of Winnipeg Executive Policy Committee
September 12, 2018

Regarding the Report on the City of Winnipeg Mattress and Box Spring Recycling Pilot Project with Mother Earth Recycling

MOTHER EARTH
RECYCLING
Creating A Sustainable Community, Together

Building Community and Capacity

As an Indigenous owned and operated social enterprise business, Mother Earth Recycling enhances the local and global environment and creates meaningful employment and capacity building opportunities targeted at Indigenous workers through financially sustainable recycling operations.



Indigenous Owned and Operated

Established in 2012 as a social enterprise business through the purchase of Syrotech Industries and a capital infusion of $300,000 by Mother Earth Recycling's Shareholders.

Neeginan Centre

Centre for Aboriginal Human Resource Development

Aboriginal Council of Winnipeg

Mother Earth Recycling Bottom Lines



Mother Earth Recycling's mandate is to operate as a financially sustainable social enterprise business based on its three "bottom lines"

1. PROFIT: "Purpose driven" financially viable business operations
2. PLANET: Promotion and protection of local and global environments
3. PEOPLE: Creating opportunities for Indigenous people to improve their lives and socio-economic circumstances

Mother Earth Recycling – Proven Results



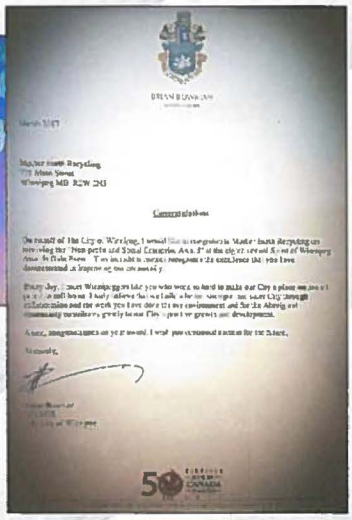
2016
Small to Medium Enterprise from the Aboriginal Chamber of Commerce



2016
Excellence in Sustainability Award - Government of Manitoba Department of Sustainable Development



8th Annual
Winnipeg Chamber of Commerce
Spirit of Winnipeg
Award Social Enterprise



Mother Earth Recycling Economic Impacts

Shareholder investment $300,000

Funding $970,000
Government
Organizational
Private sector

Revenues $1,500,000
E-waste resale
E-waste recycling
Mattress recycling

TOTAL $2,770,000

Wages $1,660,000
45 FTE Direct Jobs
108 FTE Induced Jobs

Goods and Services $480,000

Multiplier Effect $700,000

Government Revenues $590,000
CPP and EI
Income Taxes
GST and PST
Other Fees

Government Savings
EIA and EI
Justice System
Health Care
Social Services

Mother Earth Recycling Personal Impacts

Transitioning chronically unemployed or underemployed individuals into meaningful employment reduces:

- *Incidence of crime*
- *Violent behaviour*
- *Homelessness*
- *Family disruption*
- *Mental and physical health problems*
- *Social unrest*



City of Winnipeg and Mother Earth Recycling A History of Working Together

Standing Policy Committee on Infrastructure Renewal and Public Works - 2013
*City Council motion encouraging the Winnipeg Public Service to "**collaborate with MER to explore potential opportunities for recycling in the Community Resource Recovery Centres**"*

City's Standing Policy Committee on Infrastructure Renewal and Public Works - 2014
*Motion to request "... the Winnipeg Public Service ...to collaborate with Mother Earth Recycling (MER) to explore potential opportunities for recycling in the Community Resource Recovery Centres". It was noted that this collaboration between the City and MER would have the following benefits: (1) "job creation for young Aboriginal people", (2) "ensuring a re-use option for surplus electronics" and (3) **"ensuring pick-up of surplus electronics, mattresses and furniture".***

*Standing Committee on Water and Waste, Riverbank Management and the Environment Feb. 2016 motion that "the Winnipeg Public Service **continue discussions with Mother Earth Recycling about potential opportunities for mattresses**, other materials, and 4R Depot."*

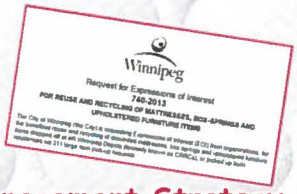
*Formal "Working Group" (City, Province and MER) struck to **review mattress recycling options***

*MER submits **Mattress and Box Spring Recycling Diversion Pilot Project Proposal** to City - July 2016*

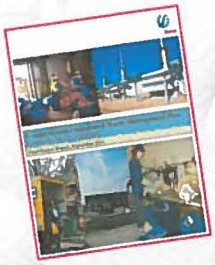
*City submits **Mattress and Box Spring Recycling Diversion Pilot Project Proposal** to MER - Sep. 2018*

City of Winnipeg Mattress Recycling Considerations

2013: City Expression of Interest for reuse and recycling of Mattresses and Box Springs.

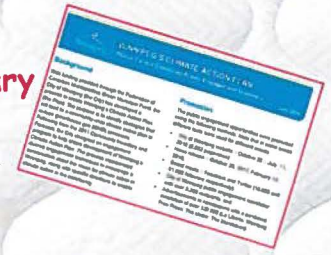

Winnipeg

Request for Expressions of Interest
740-2013
FOR REUSE AND RECYCLING OF MATTRESSES, BOX SPRINGS AND UPHOLSTERED FURNITURE ITEMS



2011 Comprehensive Integrated Waste Management Strategy report also recommends in its Near Term Private Sector Initiatives that "the City should make provisions to keep certain material streams such as bulky materials separate (e.g. mattresses), to facilitate processing of these materials should options become available."

2018 Winnipeg's Climate Action Plan Engagement Summary Recommended development of mattress recycling program was identified under heading of "What We Heard: Notable Insights and Outcomes"


WINNIPEG CLIMATE ACTION PLAN

Mattress and Box Spring Recycling Partners

33 months of actively collecting mattresses
9,000 units diverted @ 95% materials recycled

Ikea	***Universities***	***Manitoba Government***
Sleep Country	***Care Homes***	***WHRA***
The Brick	***Main Street Project***	***General Public***
CanadInns	***Ma Mawi Wi Chi Itata***	***12 Rural Municipalities***

MER has received inquiries from Regina and Saskatoon about the possibility of shipping units to MER for processing.

MER was paid $15 per unit from every organization, business, individual and municipality for all 9,000 units. All units from the rural landfills and businesses are shipped to MER at a cost borne entirely by the supplier.

Mattress and Box Spring Recycling Partners

Rural landfill operators recycling mattress and box spring units with Mother Earth Recycling services all expressed similar opinions and comments about why they recycle - and why they pay $15 per unit.

"...conservative estimate is that each mattress removed is saving us over $20 in space, operations, downtime, and staff inefficiencies."

"It was never an option of yes or no to doing the mattress recycling; it was always 100% to do it from the start due to benefits in the volume we keep out of the landfill, operational requirements and the reduction of Green House Gases from the foam breaking down."


Rural Municipality of North Norfolk
Delivering Mattresses to Mother Earth Recycling

"we did not need to do any formal analysis to know that the benefits would outweigh the costs of running the project.".

Mattress Recycling Initiatives Across Canada

Mattress Recycling operations exist in Cities and Municipalities across Canada

Vancouver	Edmonton	Peterborough	Barrie
Delta	Orillia	Cornwall	Toronto
Surrey	North York	Simcoe County	Montreal

Recycling of mattress and box spring units is mandated through bans on units from landfills and encouraged through extra tipping fees for landfilling units, support to individuals to recycle units, community pick-up drives and public awareness campaigns. Recycling operations include non-profit organizations, social enterprises and commercial businesses.

Landfilling Mattress and Box Spring Units Impacts

Estimated 30,000 to 40,000 mattress and box spring units disposed in BRRMF every year

For our purposes, lets use 35,000...

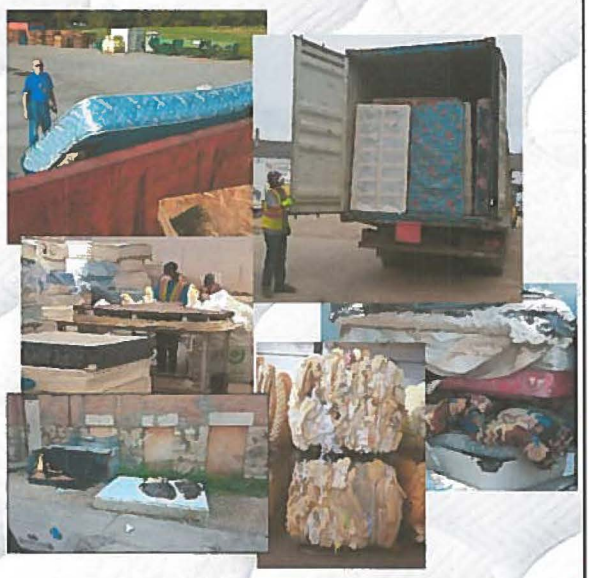
1,270 tonnes of waste

23,000 cubic meters of landfill space

Steel	Wood
Foam	Polyester
Wool	Cotton
Flame Retardants	Adhesives

Landfill leachates in groundwater

Production of Greenhouse Gases



City of Winnipeg Dedication to Reconciliation

Our Principles

Reconciliation must create a more equitable and inclusive society by closing the gaps in social, health, and economic outcomes that exist between Indigenous and non-Indigenous Canadians.



Our Commitments

The City of Winnipeg is committed to engaging multiple sectors, organizations, groups, and individuals across Winnipeg to build new initiatives, partnerships, and advance reconciliation efforts with Indigenous Peoples, guided by the 94 Calls to Action of the Truth and Reconciliation Commission of Canada.

CALL TO ACTION 92ii: Ensure that Aboriginal peoples have equitable access to jobs, training, and education opportunities in the corporate sector, and that Aboriginal communities gain long-term sustainable benefits from economic development projects.

Our Vision

We are all working towards the same goal - to build happy, resilient, strong, and prosperous families.

"Real Costs" of Landfilling Mattresses

Six Factors to Consider



1. Airspace taken up by mattresses
2. Compaction rate of mattresses versus "typical" waste
3. Airspace costs (land, financing, construction, operation, closure, aftercare)



4. Extra operational costs due to the nature of mattresses
5. Tipping fees
6. Environmental costs and impacts

It's Complicated ... Confusing ... Uncertain

Recognized Costs of Landfilling Mattresses

According to industry overviews the real costs of recycling mattresses can range from $10 to $25 per mattress.

The City of Winnipeg charges a special fee of $20 for mattresses that a resident brings to the BRRMF.



Every municipality bringing mattress and box spring units to Mother Earth Recycling pays $15 per unit.

Environmental Benefits of the Pilot Project

- ✓ Divert approximately 580,000 kgs of mattress units from Brady Road Resource Management Facility
- ✓ Save over 10,000 cubic meters of landfill space
- ✓ Reduce CO2 emissions by over 1,000,000 kg of C02 equivalents
- ✓ Recycle 115 tonnes of steel, 18 tonnes of wood and 13 tonnes of foam



- ✓ Reduce need for mining and production of new metals and materials (resource and energy savings)

City Pilot Project General Recommendations

Representatives of the City, Province and Mother Earth Recycling have worked collaboratively over the past three years to identify and address operational issues associated with the proposed pilot project. We appreciate the hard work that City of Winnipeg staff have invested in developing an operational model for the proposed pilot project. We believe that we developed a workable and viable model for the pilot project.

The logistics outlined in the City report on the pilot largely reflect - with the exception of one crucial sentence - the arrangements that we mutually agreed upon (although they do not always reflect one or another parties' first preference). Until the final report, the process was an excellent example of like-minded parties working together towards common goals.

City Pilot Project Recommendation – 50% Funding

Mother Earth Recycling cannot accept the City's proposed requirement that Mother Earth Recycling must find a 50% partner for the pilot project for several reasons.

1) Mother Earth Recycling believes that some of the City's estimates for its cost for delivering the pilot project could be interpreted and calculated differently. Those costs are estimated at:
    1. $45,000 for purchasing mattress and box spring unit bins for BRRMF
    2. $45,000 for "contingency costs" for hauling units to 771 Main Street
    3. $6,000 for "advertising the pilot project
    4. $64,000 in projected loss of tipping fees

2) Asking Mother Earth Recycling to secure $200,000 to offset some of the City's costs for the pilot project will result in a net payment of $40,000 by the City to Mother Earth Recycling for the pilot project or $2.50 per unit at the projected recycling of 16,000 units over the two years. Agreeing to that arrangement could put Mother Earth Recycling's contractual arrangements with others for whom it recycles units at $15 per unit cost at risk.

3) The requirement for Mother Earth Recycling "giving' the City $200,000 to subsidize the City's "estimated cost of the pilot project" ignores the substantial sums that other parties have already invested in enabling Mother Earth Recycling to undertake the pilot project.

Putting It All In The Proper Perspective

The City of Winnipeg Mattress and Box Spring Recycling Pilot Project is not only about keeping mattresses and box spring units out of the landfill.

IT IS ABOUT

promoting environmental responsibility – for the City and its residents
advancing Winnipeg's commitment to divert materials from its landfill
reducing Winnipeg's carbon footprint
reinforcing City's commitment to reconciliation and its Indigenous Accord
keeping hazardous wastes and GHG out of local and global environments
creating meaningful employment for Winnipeg's Indigenous community
improving lives and socio-economic conditions of Indigenous workers
reducing the financial, social and personal costs of unemployment
building stronger communities and local economies
strengthening Winnipeg's social enterprise business sector

City of Winnipeg Mattress and Box Spring Recycling Pilot Project

For All the Right Reasons
In the Right Way
At the Right Time



Mattresses and Landfills

Why recycling mattresses makes more sense economically than landfilling!

By: Gregory Conigliaro and Paul Careau

Conigliaro Industries recently built a Mattress Shredding and Recycling Plant at our Framingham, Massachusetts Facility. While landfills receive thousands of mattresses each year, there are many reasons to recycle mattresses and boxsprings, rather than landfill them:

1) **Lost Revenue** - each cubic yard of landfill space generates a certain amount of revenue. Historically, landfill compaction rates for trash were 800 - 1000 pounds/cubic yard. More recently, with better equipment, landfill operators have achieved compaction rates of 1200 - 1400 pounds/cubic yard. Some landfills have even achieved compaction rates of up to 1600 pounds/cubic yard due to larger equipment. For our analysis we shall use a 1500 pounds/cubic yard rate. Most landfills continue to charge a per ton tip fee regardless of the material, including mattresses. This certainly applies to mattresses mixed in with typical trash and C & D loads. For our analysis we shall use a trash tip fee of $75/ton.

Conigliaro Industries performed tests at our facility to gauge the maximum compression of a typical 12" thick mattress. We were able to achieve a maximum of 66% compression by volume. Based on all of these facts, a typical landfill will lose revenue by taking in mattresses:

120 cubic yards of uncompacted mattresses equals 10,000 pounds = 83 pounds/cubic yard

Assuming MAXIMUM Compression of 66%, which is very conservative, this equates to 83 pounds/cubic yard x 3 = 250 pounds/cubic yard

The revenue generated is therefore:

250 lbs/cubic yard [divided by 2000 lbs/ton] x $75/ton = $9.38 per cubic yard of landfill space.

This compares unfavorably to the same cubic yard of landfill space without compressed mattresses:

1500 lbs/cubic yard [divided by 2000 lbs/ton] x $75/ton = $56 per cubic yard of landfill space.

2) **Shortened Lifespan** - the inclusion of mattresses in a landfill with shorten its lifespan. In Massachusetts alone, close to 150,000 retail mattresses and boxsprings are wasted each year.

This amounts to 144,000 cubic yards of landfill space uncompressed and 47,520 cubic yards of landfill space assuming perfect compression. This is space that is extremely difficult to build given the many barriers to entry including permits, capital costs, nimby, etc....

3) **Operational Issues** - Mattresses are a very difficult material to process at a landfill or transfer station. They do not compact well in reality and they do not retain their daily cover very well. Once exposed during the compaction process, the springs of a mattress have a tendency to disable landfill and transfer station equipment.

4) **Recycling Issues** - The Commonwealth of Massachusetts has very aggressive recycling goals spelled out over the next five years. As part of their 70% recycling rate goal, the possibility of banning easily recyclable items such as mattresses and boxsprings is very real. Our experience has shown that a typical resident is very much willing to pay a fee to recycle something as identifiable as a mattress or boxspring. Conigliaro Industries has built a facility capable of handling up to 150,000 units per year. We have demonstrated an ability to achieve recycling rates of at least 60% and as high as 90% for this very difficult material.

For all of the above reasons, the recycling of mattresses makes sense for landfills and transfer stations.

OTHER MATTRESS RECYCLING PROGRAM FACTS:

Conigliaro Industries normally places a trailer for the collection of mattresses at landfill locations. The customer may place all types of twin, full, queen and king size mattresses on each trailer. Box springs may also be placed on the trailer, however due to the fact that they are easily compacted (no springs), most landfills will continue to process and landfill them. The trailer shall be 45 feet in length and have a capacity of 120 cubic yards. Based on our experience, you may expect to fit 10,000 pounds of mattresses on each trailer. We expect you to fit an average of 125 units of mixed sizes on each trailer as follows (although up to 140 units per load is not unreasonable):

SIZE	% OF LOAD	NUMBER OF UNITS
Twin	33%	55
Full	23%	27
Queen	34%	35
King	10%	8
	100%	125 units

Questions about this publication may be addressed to:

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Math for Burying Mattresses



What does it really cost to landfill a mattress?

The answer is $20.60 per mattress.

By Brian Tippetts 8/2/16
7 Rivers Recycling

Check out the assumptions. Check out the math. Your numbers may vary.

1. **There is $5 in extra equipment and labor costs for each mattress.**

   Why?

   - Mattresses can't be buried on an outside landfill slope because they become drainage conduits for leachate; causing side slope leachate seeps. Therefor mattresses must be moved to the interior of the landfill. This is extra time and money.
   - Mattresses surfaces are smooth, even 'steep', so daily cover slides off. Therefore mattresses that are on the surface at the end of the day need additional earthen landfill cover to achieve the required 6 inches of daily cover. This is extra time and money.
   - Mattress don't compact well, so they leave air pockets that can aid in the spreading of underground fires, thus costing more in equipment and labor to stop a landfill fire.
   - Mattress springs become entangled in the landfill equipment and must be cut and pulled free of the equipment, or the equipment will be damaged, or the equipment will not work properly which could even reduce compaction. Cutting and pulling springs, often entrapped with garbage, from equipment is a nasty job. This nasty job significantly increases the chances that a worker will be injured in the process. This is extra labor and downtime which costs money.

So what is the extra equipment and labor costs to manage mattresses in the landfill? Ten minutes a mattress? Five minutes a mattress? A study done by a major US solid waste entity looked into this question and determined it was 3 minutes a mattress. If we use a combined equipment and labor rate of $100/hour, then 1 minute of addition effort cost $1.66 ($100/hour ÷ 1 hour/60 minutes = $1.66/minute). So an extra 3minutes equal $5, which means it costs five additional dollars to handle a mattress.

2. There is $17.85 net loss in landfill airspace revenue.

How so?

The landfill financial model has a peculiarity. Landfills account for their revenue by weight, e.g. $60/ton, but their expenses are by volume e.g. licensed airspace for waste. This means landfills want to tightly compact waste to minimize consuming landfill air space. Landfills are getting better at waste compaction, but mattresses still don't compact well. In fact compaction rates continue to rise, with landfills reaching 1,500 to 2,000 pounds per cubic yard .

The point is; regular trash compacts well thereby minimizing the consumption of landfill airspace while mattresses do not compact well, thereby consuming far more space for their weight.

However the direct revenue a landfill receives for 1 ton of household trash or 1 ton of mattresses are the same. (See Table 1)

Weight revenue for household trash and mattresses Table 1

Material	Disposal Fee	Revenue
1 ton (2,000 lb) of Household trash	$60/ton ($.03/lb)	$60/2,000lb
75 lb of Household trash	$60/ton ($.03/lb)	$2.25/ 75lb
1 ton (2,000 lb) of Mattresses	$60/ton ($.03/lb)	$60/2,000lb
75 lb of Mattress	$60/ton ($.03/lb)	$2.25/75lb

Even though the direct weight revenue received for equal weights of trash or mattresses are the same; the landfill gets far more revenue out of a cubic yard of landfill airspace consumed by trash than mattresses. How much revenue does a landfill get from a cubic yard of compacted household trash? (See table 2)

Volume "revenue" for household trash and revenue Table 2

Material Weight	Revenue/lb	Compaction	Revenue received for cy of landfill airspace
1 ton (2,000lb) of Household trash	$60/2,000lb	1,750lb/cy	$52.50/cy
75 lb of Household trash	$2.25/ 75lb	1,750lb/cy	$52.50/cy

Obviously mattresses take up a disproportion amount of air space for their weight as compared to household trash, but how much? A study by Gregory Conigliaro and Paul Careau on behalf of Conigliaro Industries, Inc concluded that mattresses can be compressed by 66% in a landfill. *(By the way, King County Washington and others site this study.)* So what is the value of the space consumed by one mattress in a landfill? (See Table 3)

Value of landfill airspace consumed by a mattress					Table 3
Typical Mattress	Volume of 1 queen mattress w/o compaction	Compaction rate @ 66%	Airspace used by 1 mattress	Value of 1 cy of landfill airspace	Value of airspace used by mattress
1 queen mattress 60" x 80" x 10" or ~1 cy	1cy	.66 cy	.34 cy	$52.50/cy	$17.85

What then is the net cost to landfill 1 queen mattress? (See Table 4)

Net cost to landfill a mattress				Table 4
Mattress type	Value of landfill airspace	Value of extra handling	Offsetting weight revenue for mattress disposal	Net cost
One 75lb queen mattress	$17.85	$5.00	-$2.25	$20.60

What does it cost your landfill to dispose of a mattress?

You can know by adjusting the assumptions for your landfill by knowing:

1. The fully burdened hourly rate for landfill compactor and labor.
2. The landfill's tipping fee.
3. The landfill's compaction rate.

Economic Impact of Neeginan Centre

Neeginan Centre and its major tenants – specifically, CAHRD and AHWC – are instrumental participants in a grassroots entrepreneurial movement. Their objective is to improve the social and economic conditions of the Indigenous people who are adapting to life in Winnipeg.

The proponents of ACWI conceived of and implemented the development of Neeginan Centre by mobilizing public and private partners to allocate resources to achieve this objective. Together, Neeginan Centre, its tenants, their public and private partners, stakeholders, and the Indigenous community of Winnipeg have all benefited from this joint cooperation.

Their work has included the following achievements:

- **$15 million in property assets** have been created for Winnipeg's Indigenous community;
- Neeginan Centre generates an **annual income of $1 million from rents and restaurant and catering operations**;
- About **200 people are employed in Neeginan Centre, earning $5 million annually;**
- Over **4,000 Indigenous people participate in education, training, and employment programs at Neeginan Centre annually**;
- Over **2,000 Indigenous people gain employment through their participation in programs offered at Neeginan Centre, earning a potential $35 million annually**;
- Over the past ten years some **16,000 Indigenous people have earned a potential $300 million**;
- About **$45 million in provincial and federal personal income taxes are generated annually**;
- Some **$100,000 in GST and PS generated annually**; and
- Over **$1 million in property taxes** have been paid to the City of Winnipeg.

PROGRAMS AT NEEGINAN CENTRE

- Learning & Literacy
- Grade 12 Upgrade
- Post Secondary Technical
- Youth & Adult Skills & Employment
- Trades & Specialization Training
- Student Housing
- Child Care
- Health & Wellness

INDIGENOUS BUSINESSES & DEVELOPMENTS IN WINNIPEG

- APTN
- NCI Radio
- Several Newspapers
- First Nations Bank
- Peace Hills Trust
- Me-Dian Credit Union
- Inuit Co-op
- Neeginan Centre
- Thunderbird House
- MMF Head Office
- Neeginan Technical College
- South East Tribal Council
- CAHRD
- Aboriginal H & W
- Winnipeg Friendship Centre
- Winnipeg Metis Offices
- Neechi Common
- Adam Beach Film Studio
- Three Gas Stations
- Aboriginal Chamber
- Players Golf Course
- Student Residence

DEVELOPMENTS STIMULATED BY NEEGINAN CENTRE

- Body shop converted to welding training facility
- Development of day-care facility.
- Built a students' housing complex – Neeginan Village.
- Development of Aboriginal Aerospace Initiative facility.
- Development of Technical Training Centre.
- Health & Wellness Centre.
- Thunderbird House - designed Douglas Cardinal.
- Major street-scaping - Main St. and Higgins
- Manitoba Metis Federation office complex on Henry.
- Stimulated major projects by other agencies.

Once social change begins, it cannot be reversed.

You cannot uneducated a person once he has learned to read.

You cannot humiliate a person who feels pride.

You cannot oppress the people who are not afraid any more.