

# Snap-Pipes

Re-Imagining Undergrounding  
Helping Mitigate Climate Risk  
Reducing Time and Cost of Undergrounding



# 1. Re-Imagining Undergrounding

## Process Simplification

**Snap-Pipes**

Current Method

### Escalating Costs

Individual Project Planning  
Individual Project Engineering  
Construction Standards  
Construction Management:  
Trench Fill Materials  
Heavy Equipment  
Scheduling Skilled Labour  
Long Lead Time  
Complex Inventory Management

Centralized Effort

~~Individual Project Planning~~  
~~Individual Project Engineering~~  
**New Construction Standards**  
Construction Management:  
~~Trench Fill Materials~~  
~~Heavy Equipment~~  
**Plentiful Non-Skilled Labour**  
~~Long Lead Time~~  
**Simple Inventory Management**

Field Empowerment

### Declining Costs

Snap Pipes

#### All Terrain

Asphalt  
Concrete  
Rock  
Clay  
Loam  
Sand  
Marsh  
Forest  
Woods  
Water  
Snow  
Ice

Backfill

**Snap-Pipe**

**Snap-Pipes**

Paid from Construction Savings





# 2. Re-Imagining Undergrounding

*Improving Efficiency & Effectiveness in cabling*



## All Terrain

Asphalt  
Concrete  
Rock  
Clay  
Loam  
Sand  
Marsh  
Forest  
Woods  
Water  
Snow  
Ice

Backfill

Snap-Pipe

Snap-Pipes

All Weather  
All Terrain

- Single Solution
- Less Inventory
- Land + Water
- Global Use

No Heavy  
Machinery

- Rental Savings
- Fuel Savings
- Job flexibility
- Use Hand tools

Env. Benefits  
(CO2 tons/mile)

- Snap-Pipes->2.8
- Machines-> +++
- Fuel-> ++++
- Vegetation-> ++

Little or No  
Excavation

- Surface Run
- Shallow Trench
- Time Saving
- Labour Saving

Eliminate "Fill"  
Materials

- Sand
- Flagstone/Brick  
Cover

Other Savings

- No Vegetation  
Management
- Un-armoured  
Cable

Snap-Pipes

Paid from Construction Savings

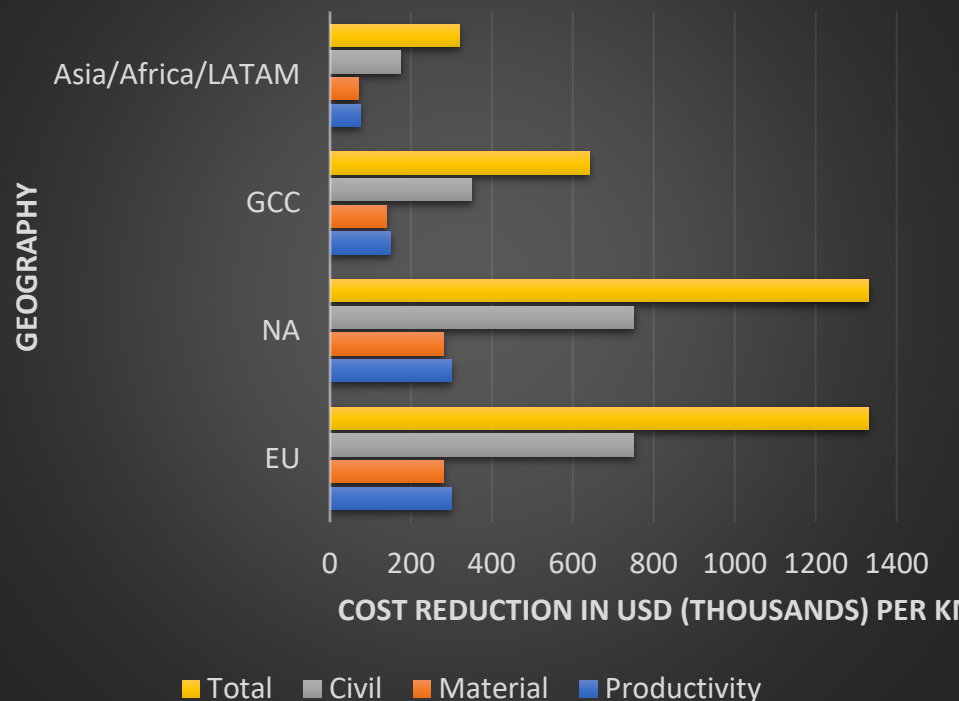


# 3. Re-Imagining Cost Reduction

## Drastic Reduction in Civil Construction & Trenching Costs

**Snap-Pipes**

Potential Cost Reduction  
Global Comparison (\*)



### Savings

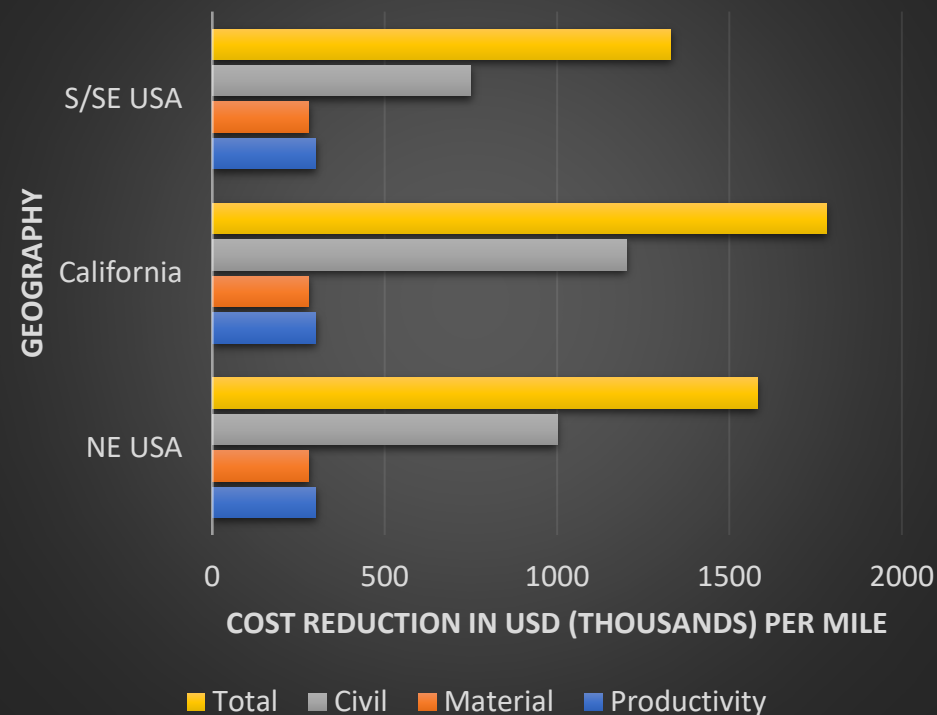
Planning  
Material  
Process  
Labour  
Equipment  
Time

### Other Savings

No Vegetation  
Management

Easy cable  
repair - open  
at fault  
location only

Potential Cost Reduction USA (\*)  
Base 3.8M\$/mile (2023)



(\*) individual project cost reduction will depend on material and labour costs in each jurisdiction

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**Snap-Pipes**

**Paid from Construction Savings**



# Snap-Pipes

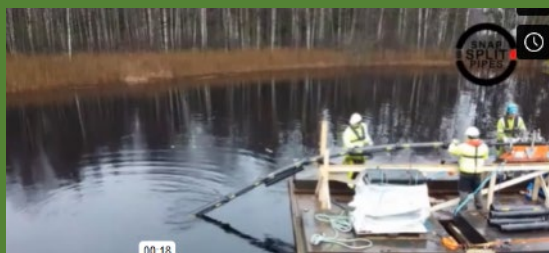
All-terrain - Single Solution

- **Flexible Split Pipe Interlocking System:**

- Recycled (PP-EPDM) Automotive Plastic (~2.8 t CO2-eq/mile)
- Ambient -40 to +55 ° C (-40° F to 135° F)
- UV & Impact Resistant
- Collar Flex 22/15/7 degrees (x-y-z planes)
- **Same Tests as Other Underground Electrical Pipes (EN 61386-24)**
- **Fire Resistance Coating available upon request**

- **Single System – Multiple Installation:**

- HV / MV / LV Cables (1C and 3C)
- Open only select fault location sections – Rest undisturbed
- **All-Topology - Above-Grade, Shallow Below-Grade; Underwater**
- **All Soils – Rocky, Clay, Sand. Forest, Marsh, Snow, Permafrost**
- **No Power Tools, Simple & Fast Operation**



Click View Button OR Click "Trust Document" in PDF to activate video



Cable Protection System | Biosirus Inc.



Cable Protection System | Biosirus Inc.



Cable Protection System | Biosirus Inc.



# Best Value

**Snap-Pipes**

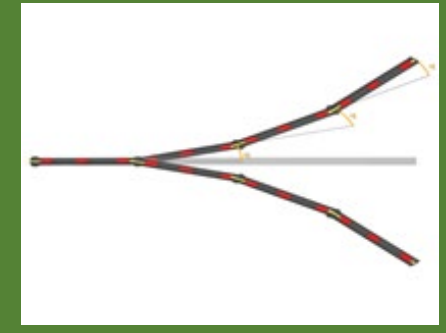


- High Fuel Costs
- Remote Distances
- Expensive Rentals
- Easy Scheduling

- Trade Special Labour
- High Labour Rates
- Project Delays
- Low Productivity

- Few Sizes
- All Terrain Application
- Outdoor/Site Storage

- Forest, Thicket
- Rock, Clay, Sand
- No Shoring
- Water Bodies



# North America:

**Snap-Pipes**



## Canada



### Manitoba Hydro

- Little Grand Rapids, Family Lake, Manitoba
- 0.5 km (1640 ft) – Lake Crossing/Onshore



### Hydro One

- Bancroft Lake Area. Ontario
- 1.2 km (0.75 miles); multiple shorelines



## USA



### PG&E

- Innovation Pitch Fest 2023 Winner
- Underground Category



### Select Utilities

- Discussions
- HV/MV/LV Undergrounding of O/H lines



**Channel/Service  
Partners**



# European Union:

**Snap-Pipes**



## Sweden



### Wind Farms

- Aland (4.4 Km), Blakliden, Fäbodberget
- Stigshöjden – Above ground (4.4 Km)



### Urban

- Tingsryd Town (just 0.35 m under asphalt)
- Above ground temporary construction cables (1.6 Km)



### Above Ground

- Archipelago, Stockholm (0.8 Km)
- Lustån, Dalarna county - alongside railway tracks (2.3 Km)
- Jönköping – alongside railway tracks (700 m)



### Sub-Sea / River / Under Water

- "Möcklö-Senoren" island, archipelago Karlskrona (850 m)
- "Alsterån" River Crossing, Kalmar County (50 m)
- Snäckö, east coast archipelago (1.65 Km)



### Railway

- Above ground along railway tracks



## Belgium



### Floating Solar

- Port Oostende



## France



### Nuclear Plant

- Above Ground - Temporary Cable (2.5 Km)



# Asia and Australia:

**Snap-Pipes**

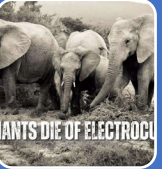


## India



### Tata Power

- Bend Restrictor - urban direct buried cables
- New Delhi and Mumbai (80m/263 ft)



### Indian Utility Discussions

- Elephant electrocution prevention
- U/G of forest O/H line sections



## Australia



### Railways - Above Ground

- Perth Area – along railway tracks
- 5.5 km



**Channel/Service  
Partners**



## Middle East/GCC



### Discussions:

HV/MV/LV & Solar PV Cable  
Protection

# Wide Product Range



Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
110 mm 4.33 in	102 mm 4.02 in	1200 mm 47.2 in	22.5 deg	1.7 Kg 3.75 lb
120 mm 4.73 in	110 mm 4.33 in	1200 mm 47.2 in	22.5 deg	2.7 Kg 5.95 lb
160 mm 6.3 in	150 mm 5.91 in	1200 mm 47.2 in	22.5 deg	3.1 Kg 6.83 lb



Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
60 mm 2.36 in	50 mm 1.97 in	1000 mm 39.4 in	15 deg	1.2 Kg 2.65 lb
110 mm 4.73 in	99 mm 3.89 in	1000 mm 39.4 in	15 deg	2.7 Kg 5.95 lb
160 mm 6.3 in	144 mm 5.67 in	1000 mm 39.4 in	15 deg	4.3 Kg 9.48 lb
220 mm 8.66 in	200 mm 7.87 in	1000 mm 39.4 in	15 deg	8.0 Kg 17.64 lb
110 mm 4.73 in	99 mm 3.89 in	220 mm 8.66 in	Straight Adaptor	0.3 Kg 0.66 lb
160 mm 6.3 in	144 mm 6.67 in	240 mm 9.45 in	Straight Adaptor	0.8 Kg 1.76 lb
110 mm 4.73 in	94 mm 3.7 in	1000 mm 39.4 in	15 deg	3.4 Kg 7.5 lb



## Uni-Weights (Marine/Shore)



Ring Stiffness	Compression	Impact Test	Heat & UV Resistance	Material Evaluation
ISO 9969-2016	EN 61386-24	EN 61386-24	ISO 4892-3/527	ISO 14044
✓	✓	✓	✓	✓

Pipe Nom. Dia.	Length	Weight	Tie Down	
76 mm 3 in	890 mm 36 in	10-12+ kg 22-27+ lb.	2 straps	
101 mm 4 in	890 mm 36 in	18-20+ kg 40-45+ lb.	2 straps	

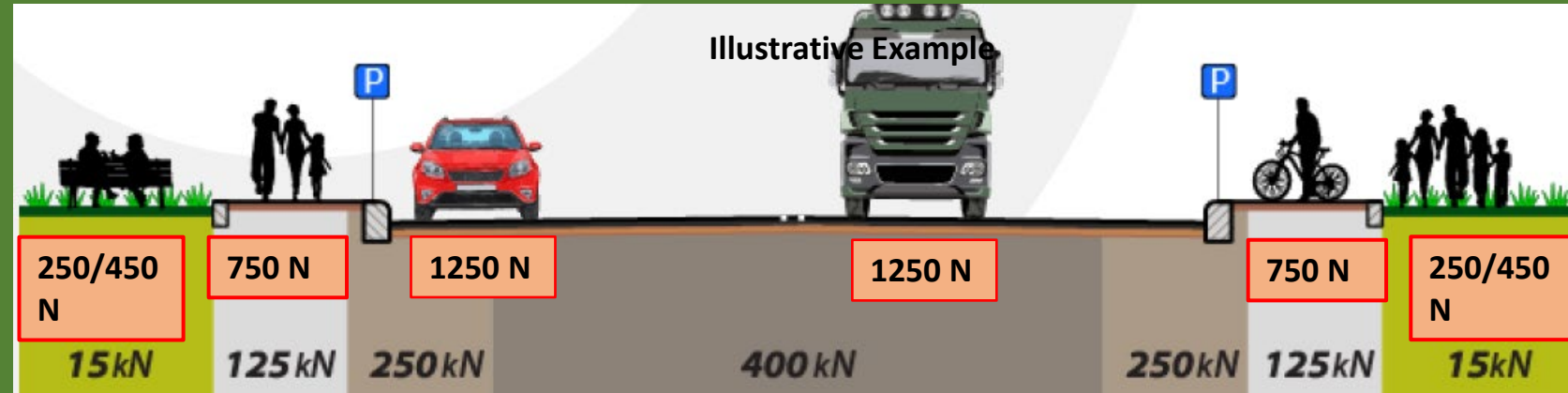
Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
70 mm 2.36 in	50 mm 1.97 in	300 mm 11.8 in	7 deg	1.0 Kg 2.20 lb
70 mm 2.36 in	50 mm 1.97 in	1000 mm 39.4 in	7 deg	3.4 Kg 7.5 lb
110 mm 4.73 in	90 mm 3.54 in	300 mm 11.8 in	7 deg	1.7 Kg 3.75 lb
110 mm 4.73 in	90 mm 3.54 in	1000 mm 39.4 in	7 deg	4.7 Kg 10.36 lb
160 mm 6.3 in	140 mm 5.51 in	300 mm 11.8 in	7 deg	2.1 Kg 4.63 lb
160 mm 6.3 in	140 mm 5.51 in	1000 mm 39.4 in	7 deg	6.0 Kg 13.23 lb

# Typical Application Notes

**Snap-Pipes**

## Notes:

- Generic guidelines per EN 61386 (5% limit)
  - Compression Strength Class: 250/450/ 750/ 1250
  - Impact Resistance: N
  - Deeper depths for higher loads, larger pipe dia.
- National Codes may differ
- Results may differ for non-typical loading
- (\*) Quicklock 110mm is 250N rated
- (\*\*) Hardlock 60mm is 450N rated



EN 61386-24: Load should not cause internal pipe diameter deformation by more than 5% (limit)

## Quicklock (Class 250 N<sup>\*</sup>/450 N) [Good]

(Depth per EN: 61386-24)

Outer Dia.	15 kN	125 kN	250 kN	400 kN
110 mm <sup>*</sup> 4.33 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in
120 mm 4.73 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in
160 mm 6.3 in	0.3 m 11.8 in	0.6 m 23.6 in	0.7 m 27.6 in	0.8 m 31.5 in

## Hardlock (Class 450 N<sup>\*\*</sup>/750 N) [Better]

(Depth per EN: 61386-24)

Outer Dia.	15 kN	125 kN	250 kN	400 kN
60 mm <sup>**</sup> 2.36 in	0.3 m 11.8 in	0.4 m 15.7 in	0.5 m 19.7 in	0.5 m 19.7 in
110 mm 4.73 in	0.3 m 11.8 in	0.5 m 19.7 in	0.6 m 23.6 in	0.7 m 27.6 in
160 mm 6.3 in	0.3 m 11.8 in	0.5 m 19.7 in	0.6 m 23.6 in	0.7 m 27.6 in
220 mm 8.66 in	0.3 m 11.8 in	0.5 m 19.7 in	0.7 m 27.6 in	0.8 m 31.5 in

## Panzar (Class 1250 N) [Best]

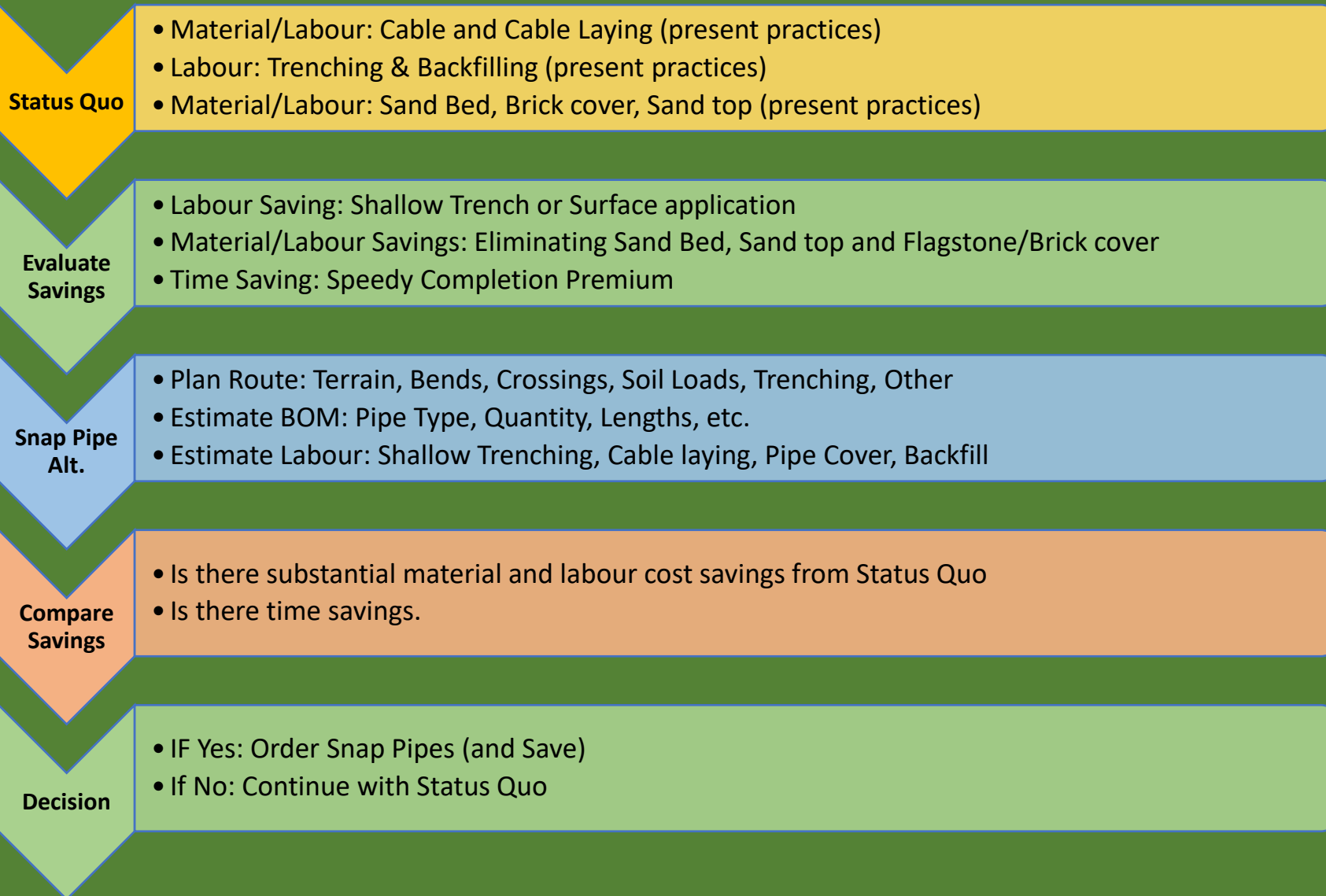
(Depth per EN: 61386-24)

Outer Dia.	15 kN	125 kN	250 kN	400 kN
70 mm 4.73 in	0.3 m 11.8 in	0.3 m 11.8 in	0.5 m 19.7 in	0.5 m 19.7 in
110 mm 4.73 in	0.3 m 11.8 in	0.4 m 15.7 in	0.5 m 19.7 in	0.6 m 23.6 in
160 mm 6.3 in	0.3 m 11.8 in	0.4 m 15.7 in	0.6 m 23.6 in	0.6 m 23.6 in



# Solution Steps

## Snap-Pipes



# In Closing:

**Snap-Pipes**

Commercialized Technology - Simple – Fast – Less Expensive

*Climate Change Mitigation at a lower cost*

## Steps:

- **Client Meeting:**
  - Product Samples/Demo
  - Standardize Needs
- **Short Term: 1-50km Field Trials**
  - Forest/Thickets (surface run)
  - Hilly Terrain (surface run)
  - Rural (shallow-trench)
  - Water Crossing (submarine)
- **Long Term: Partnership**
  - Achieve: 1,000 miles/year
  - Bulk PO → Periodic Release
  - Work with contractors
  - Establish local inventory

### Spec. Highlights



4", 5", 6"  
Sch.40 (4 mm wall)  
22° Collar Flex

### Above-Grade

Limited Use

### Shallow Below-Grade



### Water-Crossing

Not Recommended

### Hardlock



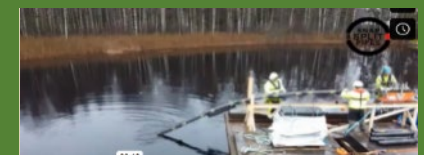
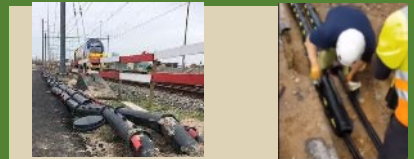
2", 4", 5", 6", 8"  
Sch.40 (5 mm wall)  
15° Collar Flex



### Panzar



2", 4", 6"  
Sch.80 (10 mm wall)  
7° Collar Flex





[Downloads \(biosirus.com\)](http://Downloads(biosirus.com))



# Thank You

**Reducing Time and Cost of Undergrounding**  
(Surface / Below Grade / Underwater)

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