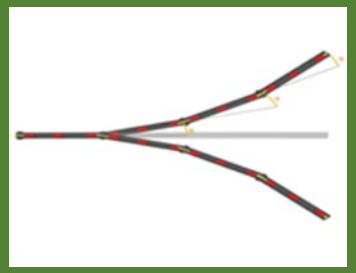
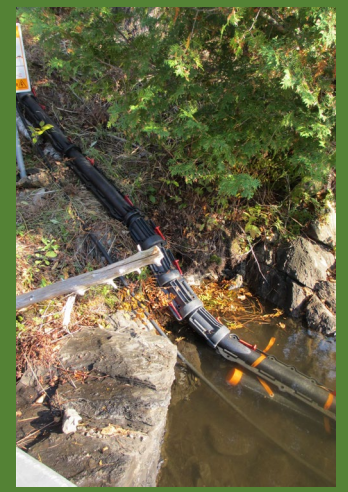




Snap-Pipes

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







1. Re-Imagining Undergrounding

Process Simplification

Snap-Pipes

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

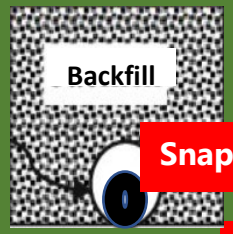
Current Method

Escalating Costs

Individual Project Planning	~~Individual Project Planning~~
Individual Project Engineering	~~Individual Project Engineering~~
Construction Standards →	New Construction Standards
Construction Management:	Construction Management:
Trench Fill Materials	~~Trench Fill Materials~~
Heavy Equipment	~~Heavy Equipment~~
Scheduling Skilled Labour →	Plentiful Non-Skilled Labour
Long Lead Time	~~Long Lead Time~~
Complex Inventory Management →	Simple Inventory Management
Centralized Effort	Field Empowerment

Snap Pipes

Declining Costs



Snap-Pipes Paid from Construction Savings

2. Re-Imagining Undergrounding

Improving Efficiency & Effectiveness in cabling

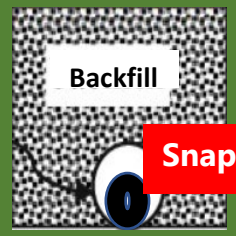
Snap-Pipes






All Terrain

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



All Weather All Terrain	No Heavy Machinery	Env. Benefits (CO2 tons/mile)
• Single Solution • Less Inventory • Land + Water • Global Use	• Rental Savings • Fuel Savings • Job flexibility • Use Hand tools	• Snap-Pipes->2.8 • Machines-> +++ • Fuel-> ++++ • Vegetation-> ++

Little or No Excavation	Eliminate "Fill" Materials	Other Savings
• Surface Run • Shallow Trench • Time Saving • Labour Saving	• Sand • Flagstone/Brick Cover	• No Vegetation Management • Un-armoured Cable

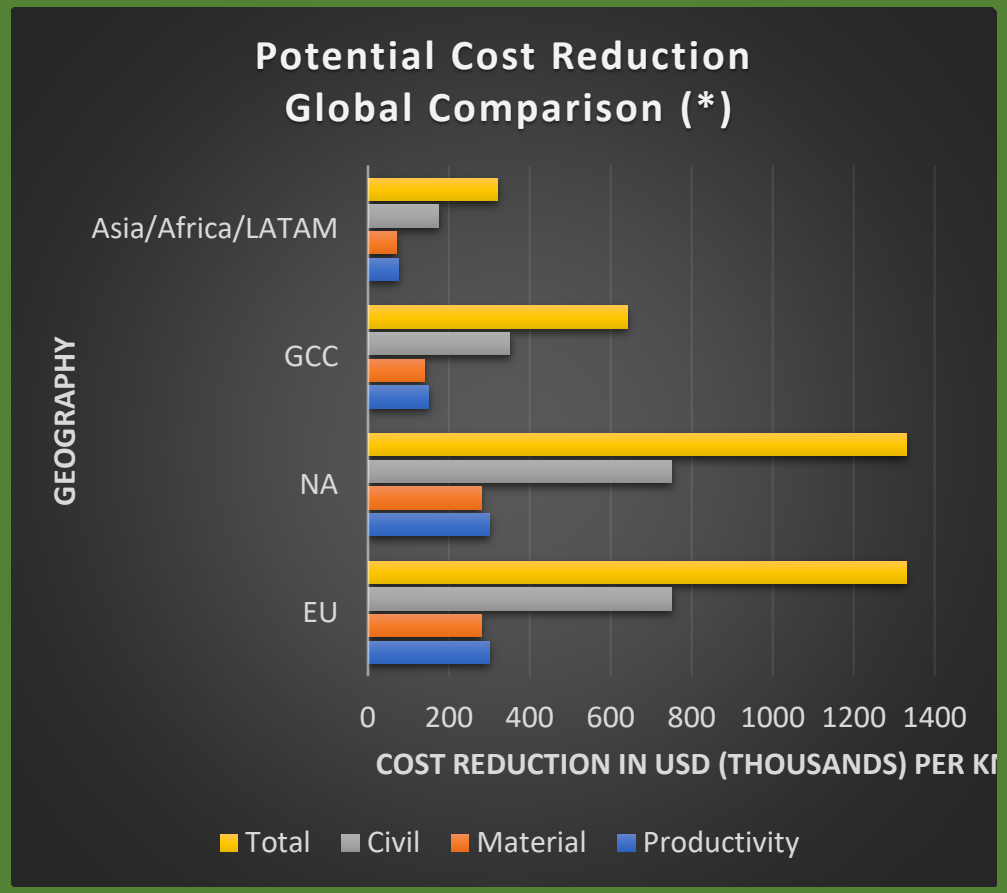
Snap-Pipes **Paid from Construction Savings**



3. Re-Imagining Cost Reduction

Drastic Reduction in Civil Construction & Trenching Costs

Snap-Pipes



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

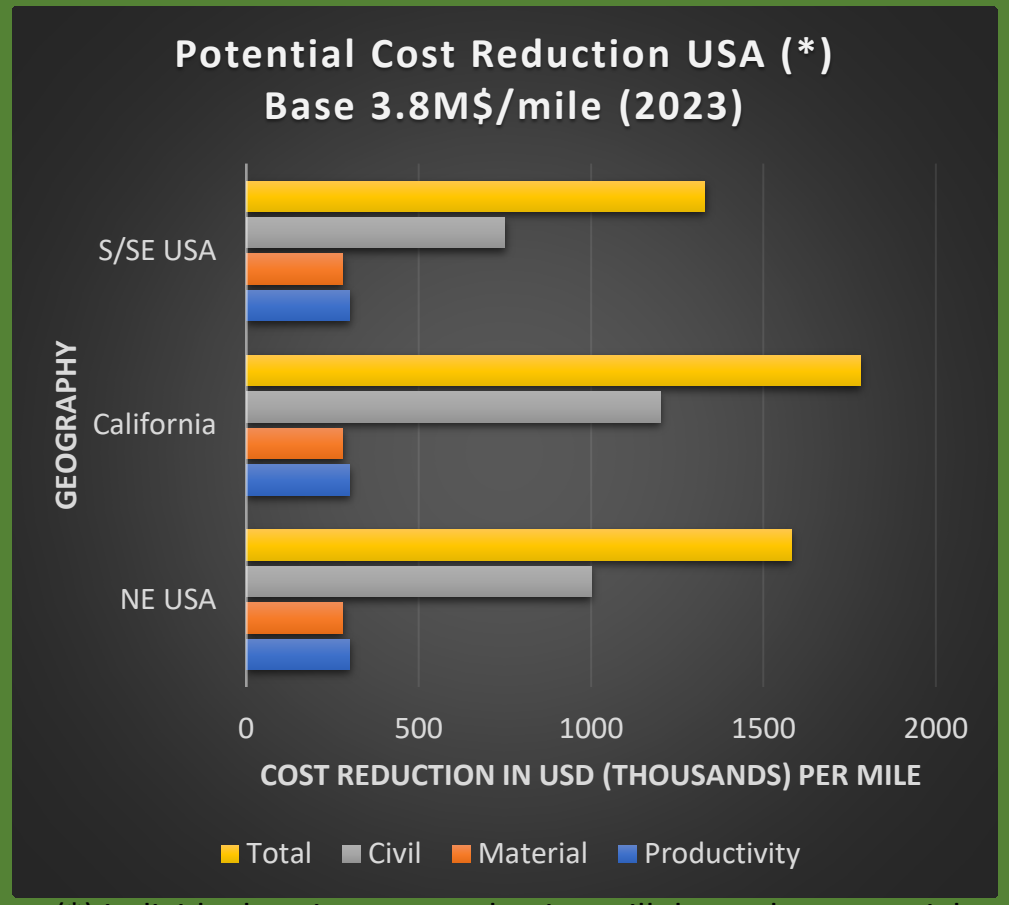
Savings

Planning
Material
Process
Labour
Equipment
Time

Other Savings

No Vegetation Management

Easy cable repair - open at fault location only



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

Snap-Pipes **Paid from Construction Savings**

Snap-Pipes

All-terrain - Single Solution

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

- **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***

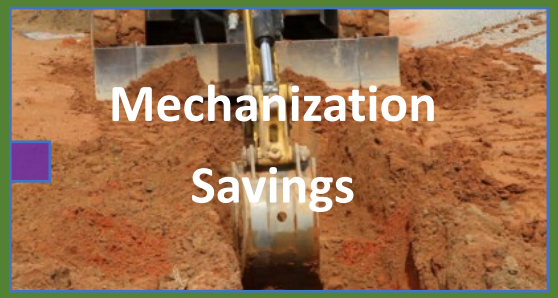
Cable Protection System | Biosirus Inc.

Cable Protection System | Biosirus Inc.

Cable Protection System | Biosirus Inc.

Best Value

Snap-Pipes

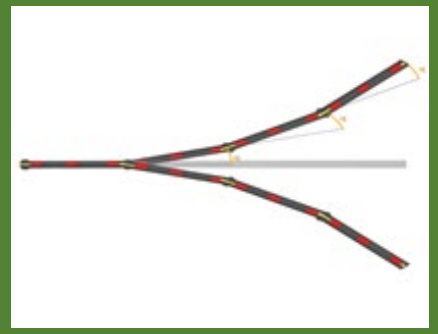


- High Fuel Costs
- Remote Distances
- Expensive Rentals
- Easy Scheduling

- 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

Robertson

PCL PRAIRIE CENTRAL LINE SUPPLY LTD.

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)

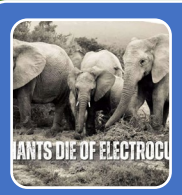
Asia and Australia:

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

Middle East/GCC

Discussions:

HV/MV/LV & Solar PV Cable Protection

Channel/Service Partners

NEXTGEN GLOBAL

Wide Product Range

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
✓	✓	✓	✓	✓

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

Uni-Weights (Marine/Shore)

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
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

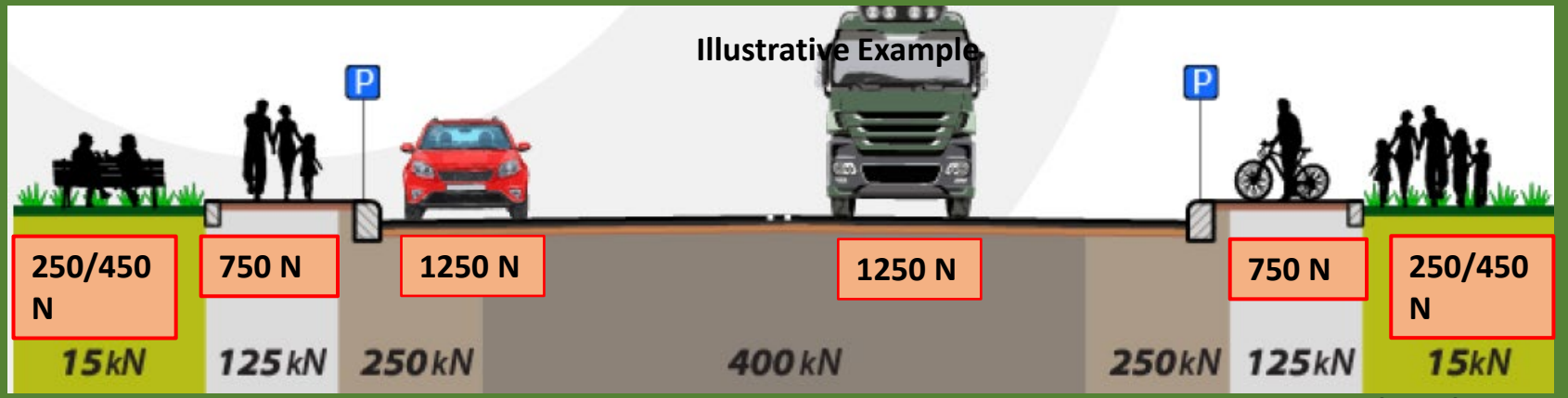
Outer Dia.	Inner Dia.	Length(s)	Joint Angle	Weight
70 mm 2.36 in	50 mm 1.97 in	300 mm 11.8 in	7 deg	1.0 Kg 2.20 lb
70 mm 2.36 in	50 mm 1.97 in	1000 mm 39.4 in	7 deg	3.4 Kg 7.5 lb
110 mm 4.73 in	90 mm 3.54 in	300 mm 11.8 in	7 deg	1.7 Kg 3.75 lb
110 mm 4.73 in	90 mm 3.54 in	1000 mm 39.4 in	7 deg	4.7 Kg 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:

1. 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.
2. National Codes may differ
3. Results may differ for non-typical loading
4. (*) Quiclock 110mm is 250N rated
5. (**) 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*/450 N) [Good]

(Depth per EN: 61386-24)

Outer Dia.	15 kN	125 kN	250 kN	400 kN
110 mm* 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**/750 N) [Better]

(Depth per EN: 61386-24)

Outer Dia.	15 kN	125 kN	250 kN	400 kN
60 mm** 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

Status Quo

- Material/Labour: Cable and Cable Laying (present practices)
- Labour: Trenching & Backfilling (present practices)
- Material/Labour: Sand Bed, Brick cover, Sand top (present practices)

Evaluate Savings

- Labour Saving: Shallow Trench or Surface application
- Material/Labour Savings: Eliminating Sand Bed, Sand top and Flagstone/Brick cover
- Time Saving: Speedy Completion Premium

Snap Pipe Alt.

- Plan Route: Terrain, Bends, Crossings, Soil Loads, Trenching, Other
- Estimate BOM: Pipe Type, Quantity, Lengths, etc.
- Estimate Labour: Shallow Trenching, Cable laying, Pipe Cover, Backfill

Compare Savings

- Is there substantial material and labour cost savings from Status Quo
- Is there time savings.

Decision

- IF Yes: Order Snap Pipes (and Save)
- If No: Continue with Status Quo

In Closing:

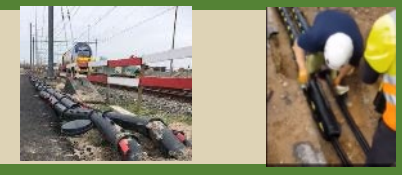
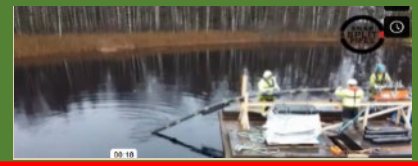
Snap-Pipes

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

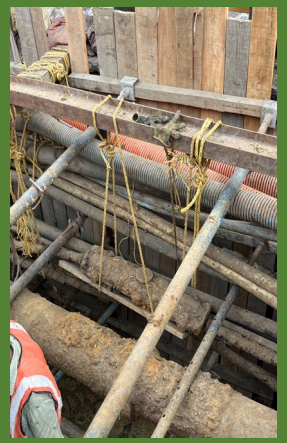
	Quicklock Good	Hardlock Better	Panzar Best
Spec. Highlights	4”, 5”, 6” Sch.40 (4 mm wall) 22° Collar Flex	2”, 4”, 5”, 6”, 8” Sch.40 (5 mm wall) 15° Collar Flex	2”, 4”, 6” Sch.80 (10 mm wall) 7° Collar Flex
Above-Grade	Limited Use		
Shallow Below-Grade			
Water-Crossing	Not Recommended		

Downloads (biosirus.com)

Snap-Pipes

Thank You

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



Biosirus Inc.

21 Amber Street, Unit 3, Markham, Ontario, L3R 4Z3 Canada
info@biosirus.com
416-498-6608
www.Biosirus.com