RA 100 – The new dimension in use of RAP

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Road construction in Europe and Australia

Europe
Many similarities

Australia
Important differences

1. European market is extremely competitive
   - Coal dust is used as fuel -> big reduction in energy cost
   - High % of recycling -> big reduction in material cost
   - Latest technologies -> reduction in operating cost
2. European Road Construction requires maximum flexibility
   - Asphalt mix are adjusted to all kind of needs (>100 recipes)
3. European environmental standards are different
   - CO, NOx, C, dust (applicable at all location)
   - Wet washers/wet scrubbers are impossible to use in Europe

Important differences

Sustainable road construction means:

Intact living space + High Mobility

It means also well maintained road network

Well maintained roads

Improvements of construction equipment

1. Environmental Requirements
2. Shift from “New Roads” to “Maintenance”
3. Improved Quality Requirement
4. Economical Crisis
5. Competitive Market

These methods have gone a long time ago...

In the Mountains of Nepal in 2002
The good old days

Today's clean asphalt manufacturing

Shift from new roads to maintenance

The 3 segments of global road construction markets

1. India, South America, Africa
   - Characteristics
     - low investment
     - mobility
     - projects

   - Total Asphalt Production
   - Maintenance
   - Rural to Paved Road
   - New Road
   - China, Russia, Eastern Europe, Asia Pacific
   - Characteristics
     - open for new technologies
     - environment coming
     - improved quality

2. USA, Western Europe, Australia
   - Characteristics
     - environment
     - flexibility
     - quality

   - Total Asphalt Production
   - Maintenance
   - Rural to Paved Road
   - New Road
   - China, Russia, Eastern Europe, Asia Pacific
   - Characteristics
     - low investment
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     - projects

3. Characteristics
   - low investment
   - mobility
   - projects

   - Total Asphalt Production
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   - Rural to Paved Road
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   - Characteristic
   - open for new technologies
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Total global Asphalt Production
- Tonnes per year
- Growth of 4.1% each year
- 2.2 billion tonnes in 2015
- 0.3 to p.a and Inhabitant
- North America 650 Mio. to p.a
- 5% of the world population
- using 1/3 of the global production
- China 440 Mio. tonnes p.a
- 2012 2015
Amman’s answer to the 3 segments

- Total Asphalt Production
  - Maintenance
  - New Road
  - Rural to Paved Road

- Total Asphalt Production
  - Maintenance
  - New Road

- Total Asphalt Production
  - Maintenance
  - New Road

EasyBatch
Speedy Batch
Blackmove

25-40% Recycling
75-100% Recycling

The future is already here

Wearing coarse with 92% RECYCLING
in Hamburg Germany

AC 0/11
Recycling (0/11) 92 %
Mineral (8/11) 8 %

Strategy: Recycling and Economy of scale

- Very well sorted Reclaimed Asphalt
- Consolidation: 100 → 50 plants
- High volume production
- High recycling ratios
- High flexibility
- Production: 1000'000 t/p/a
- Recycling: 600'000 t/p/a

Hot and Cold Recycling up to 75%

Proven technology (Batch & Conti)
500 Parallel Drums for 60%
1000 Cold Additives for 30%

Limitations:
- Super-heating
- Emissions
- RA outlet temperature

Strategy: 100% Recycling

- Highly Competitive thanks to RAP
- High RAP storage volume
- High flexibility
- Quality Assured RAP

Ammann developed a new asphalt recycling concept for 0% - 100% reclaimed asphalt
World's 1st Plant Using up to 100% Recycling Asphalt

Why up to 100% recycling?
- Excess of reclaimed asphalt
- Ecological requirement to preserve natural resources
- Economical to reuse available material

100% Recycling Device

100% Recycling Device (protected)

Process Air Circulation

RAH 100% drying drum

Treatment of reclaimed asphalt

Binder 4.0 %
Fiber 10.6 %
>2 mm 43.6 %

Binder 5.1 %
Fiber 12.4 %
>2 mm 35.1 %

Binder 3.6 %
Fiber 6.9 %
>2 mm 68.4 %
Well sorted recycling materials

Blending of reclaimed asphalt

Bitumen characteristics after heating

Determination of the parameter in the laboratory:
- Bitumen content
- Grading curve
- Softening point ring & ball R&B
- Penetration
- Fraaß breaking point

characteristic to evaluate thermal stress of bitumen

Bitumen characteristics after heating (guide values)

Penetration values:
- Sample A (cold) taken at RA feeder
- Sample B (hot) taken at drum outlet

Intelligent, fully integrated road construction

- Closing the Loop: from Road to Road
- High quality, reduced costs and construction time
- Ecology, Economy, Safety
AAPA resolution 2011

**Australia Leader in Sustainable Road Construction**
- What we take out of the road, we put back!
- Green Asphalt preferred in tenders
- Government adopts performance based principles
- Phase out processes that are not environmentally friendly.

Leadership in sustainable road construction

**AAPA Resolution 2011**
- National and state road authorities
- Supporting new technologies
- Road construction companies
- Investing in new technologies
- Equipment Manufacturing
- R&D new technologies

Thank you very much for your attention

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Drivers for sustainable road construction

- Government:
  - Emissions
  - Recycling
- Sustainable Road Construction
- Tier IV „TA Luft“
- Asphalt back to asphalt
- Shift of Focus:
  - From new roads to Maintenance
  - Lack of Funding
  - Market competitiveness

Objective: The CO$_2$ neutral asphalt plant

- Asphalt Recycling
- Low Temperature Mix
- Lower Moisture Cont.
- Alternative Energies
- Ecology SW tools
- Integrated Constr.

Solar heated bitumen farm

Direct and indirect emissions considered, without transport

-25% CO$_2$
Global solar radiation

Many countries in best solar area

Wood dust fired burner

- CO₂ neutral fuel
- Cost savings

Wood availability