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## In-class group exercise

**Building a convincing value proposition for a sustainable innovation**

(90–120 minutes incl. break)

This is a group exercise for a class of 30–40 students (example shown with 35 students). There are three roles: **regular group members** (4 per group), **business angel investors** (3–5 for the entire class), and **old & wise experts** (one per group). Each group gets a sustainable innovation scenario and has 30 min to build a business model for this innovation, including a convincing value proposition and a clear strategy for value generation and value capture. The four regular group members may request advice from their old & wise expert. Meanwhile, the business angel investors move from group to group and form their opinions, but do not speak with the group members. After 30 min, there is a presentation session where each group selects one member who gives a two-minute presentation of their value proposition to the entire class. The business angels then gather together and decide how they want to award their investment coins. The investment round is announced and the business angels explain what were the main factors influencing their decision, followed by a general discussion and feedback session.

**Schedule:**

Divide the class into groups, assign tasks and explain the rules (5 min)

Groups prepare their business scenarios and (30 min)

Short presentations (15 min; 2 min per group + 1 min transfer; chalk/whiteboard only)

Break (internal discussion business angel investors; 15 min)

Awarding of the investment coins and explanation of the influencing factors (10 min)

General discussion and feedback (15–30 min)

**Business angel investors:**

Each BA investor receives 2–4 chocolate coins, and can invest these as they see fit. They can invest all of the coins in one group, or share between several groups, or not invest at all. Prior to the internal discussion between the BAs, each BA should write down how they wish to invest their coins. They may change their decision as a result of the internal discussion, but then they should note this as well, and discuss it with the class during the award session.

**Old & wise experts:**

Each group is assigned an old & wise expert, who is given a 'cheat sheet' containing key information relating to the innovation the group is working on. The expert sits with their group but does not volunteer information unless they are asked specific questions. Group members are encouraged to find answers for themselves, but can also ask their experts for help. During the discussion session, each group should also reflect on whether they used their expert's help and how useful was it (or not).

**Prepare in advance:**

Classroom where the students can sit at group-sized tables

10 printed sheets with a blank business model canvas (A3 is preferred)

5 printed sheets with the different business cases (see below, one per group)

5 printed 'cheat sheets' for the old &amp; wise experts (see below, one per expert)

1 sheet of stickers for business angels and old &amp; wise experts (see template below)

1 bag of chocolate coins (15–20 coins)

## Sustainable innovation scenarios

1. **Renewable Energy Storage Solutions:** A company specializing in developing sustainable energy storage solutions using advanced chemical technologies. Their business model involves providing innovative battery systems that utilize eco-friendly materials and manufacturing processes. They could focus on applications such as grid-scale energy storage, electric vehicle batteries, or portable power solutions.
2. **Green Chemical Manufacturing:** A company that produces chemicals and materials using sustainable and renewable feedstocks, as well as environmentally friendly production processes. Their business model might involve partnerships with biorefineries or agricultural producers to source biomass for conversion into high-value chemicals, such as bioplastics, biofuels, or bio-based solvents.
3. **Circular Economy Solutions for Plastics:** A business focused on developing circular economy solutions for plastic waste management. Their business model could involve offering technologies for chemical recycling of plastics, creating value-added products from recycled plastics, or providing consulting services to help companies implement sustainable packaging strategies and reduce plastic waste.
4. **Water Treatment and Purification:** A company specializing in sustainable chemistry solutions for water treatment and purification. Their business model might include developing advanced materials and chemical processes for removing contaminants from water sources, such as heavy metals, pollutants, or microplastics. They could target industries such as municipal water treatment, industrial wastewater management, or point-of-use water purification systems.
5. **Green Building Materials:** A business focused on developing sustainable chemistry solutions for the construction industry. Their business model could involve manufacturing eco-friendly building materials, such as low-emission adhesives, insulation materials, or biobased coatings. They could also offer consulting services to architects, builders, and developers on incorporating sustainable materials and practices into construction projects.

## Cheat sheet: Renewable Energy Storage Solutions

1. **Key Partnerships:**
  - Technology providers: Collaborate with partners for cutting-edge energy storage solutions, investing €300K annually.
  - Energy producers: Partner with renewable energy companies, with contracts worth €1M yearly for implementing storage solutions.
  - Research institutions: Forge partnerships for innovation and R&D, allocating €500K annually.
2. **Key Activities:**
  - Research and development: Allocate €700K annually for improving storage technologies.
  - Manufacturing: Operational costs of €2M per year for producing energy storage systems.
  - Installation and maintenance: Allocate €500K annually for deployment and upkeep.
  - Regulatory compliance: Budget of €300K annually to meet industry standards.
3. **Key Resources:**
  - Skilled workforce: Payroll of €800K annually for engineers and technicians.
  - Manufacturing facilities: Capital investment of €5M for production facilities.
  - Intellectual property: Asset valued at €2.5M for patented storage technologies.
  - Access to renewable energy sources: Expend €300K yearly for sustainable energy procurement.
4. **Value Proposition:**
  - Energy independence: Offer solutions with potential savings of €3M annually for consumers.
  - Grid stability: Provide services with potential savings of €2M yearly for energy grid operators.
  - Environmental impact: Help reduce carbon emissions, potentially saving €1M annually in environmental costs.
  - Customized solutions: Offer tailored options with potential revenue of €1.5M annually.
5. **Customer Relationships:**
  - Long-term partnerships: Achieve a retention rate of 80%, resulting in €10M in annual sales.
  - Technical support: Offer services generating €1.5M in repeat business annually.
  - Customer feedback: Invest €200K annually to gather insights for improvement.
6. **Channels:**
  - Direct sales: Generate €15M in annual revenues through direct client engagement.
  - Distribution partnerships: Additional €3M in sales yearly through strategic collaborations.
  - Online platforms: Contribute €500K annually through digital channels.
7. **Customer Segments:**
  - Residential customers: Offer solutions with potential revenue of €8M annually.
  - Commercial and industrial clients: Provide energy storage solutions with potential revenue of €7M.
  - Utilities and grid operators: Supply grid stabilization services, generating €3M annually.
8. **Cost Structure:**
  - R&D expenses: Allocate €700K annually for innovation.
  - Manufacturing costs: Spend €2M annually on production.
  - Installation and maintenance: Allocate €500K yearly for deployment and upkeep.
  - Regulatory compliance: Budget €300K annually for meeting regulations.
9. **Revenue Streams:**
  - Direct sales: Generate €15M annually through direct selling.
  - Licensing fees: Add €1M to annual revenue through licensing proprietary technologies.
  - Installation and maintenance services: Contribute €2M annually.
  - Subscription-based models: Add €500K to yearly revenue through service subscriptions.

## Cheat sheet: Green Chemical Manufacturing

1. **Key Partnerships:**
  - Strategic partnerships: Invest €200K annually in collaborative projects.
  - Sustainable raw materials suppliers: Contracts worth €500K yearly ensure a steady supply chain.
  - Waste management joint ventures: Allocate €100K annually for efficient disposal and recycling.
2. **Key Activities:**
  - R&D: Allocate €500K yearly for research into eco-friendly processes and products.
  - Manufacturing: Operational costs of €1.5M per year ensure sustainable production.
  - Environmental performance: Invest €100K yearly in monitoring and improvement.
  - Compliance: Budget €300K annually to meet environmental standards.
3. **Key Resources:**
  - Skilled workforce: Annual payroll of €500K ensures expertise in green chemistry.
  - Facilities: Capital investment of €2M in state-of-the-art eco-friendly labs.
  - Access to resources: Expend €500K yearly for sustainable raw materials and energy.
  - Intellectual property: Asset valued at €3M for proprietary formulations.
4. **Value Proposition:**
  - Environmental savings: Offer solutions with a potential saving of €2M annually.
  - Cost savings for customers: Offer alternatives with potential savings of up to €1M yearly.
  - Compliance savings: Help clients avoid potential fines of €200K annually.
  - Custom solutions: Offer tailored options with potential revenue of €500K annually.
5. **Customer Relationships:**
  - Long-term partnerships: Achieve a retention rate of 75%, resulting in €5M in sales.
  - Technical support: Offer support generating €1M in repeat business annually.
  - Customer feedback: Invest €100K annually to gather insights for improvement.
6. **Channels:**
  - Direct sales: Generate €8M in annual revenues through direct client engagement.
  - Distribution partnerships: Additional €2M in sales yearly through strategic partnerships.
  - Online platforms: Contribute €500K annually through digital channels.
7. **Customer Segments:**
  - Agricultural companies: Offer solutions with potential revenue of €3M annually.
  - Cosmetic manufacturers: Provide eco-friendly ingredients with potential revenue of €2M.
  - Automotive companies: Supply biodegradable lubricants and coatings, generating €4M annually.
  - Government agencies: Provide solutions with potential revenue of €1M annually.
8. **Cost Structure:**
  - R&D expenses: Allocate €500K yearly for innovation.
  - Manufacturing costs: Spend €1.5M annually on sustainable production.
  - Compliance costs: Budget €300K yearly for meeting regulations.
  - Marketing and distribution: Spend €500K annually on promotion and distribution.
9. **Revenue Streams:**
  - Direct sales: Generate €11M annually through direct selling.
  - Licensing fees: Add €1M to annual revenue through licensing proprietary technologies.
  - Consultancy services: Contribute €500K annually through advisory services.
  - Subscription-based models: Add €300K to yearly revenue through subscription services.

## Cheat sheet: Circular Economy Solutions for Plastics

1. **Key Partnerships:**
  - Plastic waste collection agencies: Collaborate to source raw materials, investing €200K annually.
  - Recycling facilities: Partner for processing plastics, with contracts worth €500K yearly.
  - Product manufacturers: Collaborate for integrating recycled plastics, allocating €300K annually.
2. **Key Activities:**
  - Plastic waste collection: Operational costs of €1M per year for collecting and sorting plastic waste.
  - Recycling and processing: Allocate €2.5M annually for processing plastics into reusable materials.
  - Product development: Invest €800K yearly in research and development for creating products from recycled plastics.
  - Marketing and education: Budget of €300K annually for raising awareness about plastic recycling.
3. **Key Resources:**
  - Collection infrastructure: Capital investment of €3M for establishing collection centers and transportation.
  - Recycling facilities: Investment of €5M in state-of-the-art recycling plants.
  - Skilled workforce: Payroll of €1M annually for employees involved in collection, recycling, and product development.
  - Technology: Asset valued at €2M for machinery and equipment used in recycling processes.
4. **Value Proposition:**
  - Environmental sustainability: Offer solutions with potential savings of €5M annually in environmental cleanup costs.
  - Resource efficiency: Provide products with potential savings of €3M yearly by reducing the need for virgin plastics.
  - Brand reputation: Help businesses reduce their carbon footprint, potentially increasing revenue by €1.5M annually.
  - Customized solutions: Offer tailored options with potential revenue of €1M annually.
5. **Customer Relationships:**
  - Long-term partnerships: Achieve a retention rate of 85%, resulting in €15M in annual sales.
  - Technical support: Offer services generating €2M in repeat business annually.
  - Customer education: Invest €300K annually in educating customers about circular economy solutions.
6. **Channels:**
  - Direct sales: Generate €18M in annual revenues through direct client engagement.
  - Distribution partnerships: Additional €2M in sales yearly through collaborations with retailers.
  - Online platforms: Contribute €500K annually through digital channels.
7. **Customer Segments:**
  - Consumer goods companies: Offer solutions with potential revenue of €10M annually.
  - Packaging manufacturers: Provide recycled materials with potential revenue of €8M.
  - Construction companies: Supply recycled plastics for building materials, generating €5M annually.
8. **Cost Structure:**
  - Collection and sorting costs: Allocate €1M annually for collection and sorting operations.
  - Recycling expenses: Spend €2.5M annually on recycling and processing plastics.
  - Research and development: Invest €800K yearly in product development.
  - Marketing and education: Budget of €300K annually for awareness campaigns.
9. **Revenue Streams:**
  - Direct sales: Generate €18M annually through direct selling.
  - Licensing fees: Add €1M to annual revenue through licensing recycled plastic technologies.
  - Product sales: Contribute €4M annually through sales of recycled plastic products.
  - Consultancy services: Add €500K to yearly revenue through advisory services on circular economy solutions.

## Cheat sheet: Water Treatment & Purification

1. **Key Partnerships:**
  - Municipalities and utilities: Collaborate for water supply contracts, with agreements worth €1M annually.
  - Technology providers: Partner for advanced treatment solutions, investing €500K yearly.
  - Environmental agencies: Collaborate for regulatory compliance and certifications, allocating €300K annually.
2. **Key Activities:**
  - Water treatment processes: Operational costs of €3M per year for treating water from various sources.
  - Research and development: Allocate €1.5M annually for innovation in water treatment technologies.
  - Installation and maintenance: Budget of €800K annually for deploying and maintaining treatment systems.
  - Compliance and testing: Invest €500K yearly in ensuring water quality standards are met.
3. **Key Resources:**
  - Treatment facilities: Capital investment of €10M for state-of-the-art treatment plants.
  - Skilled workforce: Payroll of €2.5M annually for engineers and technicians.
  - Technology: Asset valued at €3M for water treatment equipment and systems.
  - Water sources: Invest €1M annually in securing access to water from various sources.
4. **Value Proposition:**
  - Clean water supply: Offer solutions with potential savings of €10M annually in healthcare costs related to waterborne diseases.
  - Environmental protection: Provide services with potential savings of €5M yearly in environmental cleanup costs.
  - Regulatory compliance: Help clients avoid potential fines of €2M per year by meeting water quality standards.
  - Customized solutions: Offer tailored options with potential revenue of €2.5M annually.
5. **Customer Relationships:**
  - Long-term contracts: Achieve a retention rate of 90%, resulting in €30M in annual sales.
  - Technical support: Offer services generating €3M in repeat business annually.
  - Customer training: Invest €200K annually in educating clients on water management.
6. **Channels:**
  - Direct sales: Generate €35M in annual revenues through direct client engagement.
  - Partnerships with municipalities: Additional €5M in sales yearly through contracts with local governments.
  - Online platforms: Contribute €500K annually through digital channels for information and support.
7. **Customer Segments:**
  - Municipalities and utilities: Offer solutions with potential revenue of €20M annually.
  - Industrial clients: Provide customized solutions for water treatment, generating €15M.
  - Commercial establishments: Supply water purification systems, with potential revenue of €10M annually.
8. **Cost Structure:**
  - Treatment processes: Allocate €3M annually for water treatment operations.
  - Research and development: Invest €1.5M yearly in innovation.
  - Installation and maintenance: Budget of €800K annually for deployment and upkeep.
  - Compliance and testing: Invest €500K yearly in ensuring regulatory compliance.
9. **Revenue Streams:**
  - Direct sales: Generate €35M annually through direct selling.
  - Service contracts: Add €5M to annual revenue through maintenance contracts.
  - Consultancy services: Contribute €2M annually through advisory services on water management.
  - Subscription-based models: Add €500K to yearly revenue through service subscriptions.

## Cheat sheet: Green Building Materials

1. **Key Partnerships:**
  - Construction companies: Collaborate for material supply contracts, with agreements worth €2M annually.
  - Sustainable architects: Partner for eco-friendly building projects, investing €500K yearly.
  - Distributors and retailers: Collaborate for distribution, with contracts worth €1M annually.
2. **Key Activities:**
  - Research and development: Allocate €1.5M annually for innovation in green building materials.
  - Manufacturing: Operational costs of €3M per year for producing sustainable construction materials.
  - Product certification: Invest €300K annually in obtaining eco-labeling and certifications.
  - Marketing and education: Budget of €500K annually for promoting green building practices.
3. **Key Resources:**
  - Manufacturing facilities: Capital investment of €8M for state-of-the-art production plants.
  - Skilled workforce: Payroll of €1.5M annually for engineers, technicians, and researchers.
  - Raw materials: Invest €2M annually in sourcing sustainable materials like recycled wood and eco-friendly cement.
  - Technology: Asset valued at €2.5M for machinery and equipment used in manufacturing processes.
4. **Value Proposition:**
  - Environmental sustainability: Offer solutions with potential savings of €5M annually in carbon emissions.
  - Energy efficiency: Provide materials with potential savings of €3M yearly in energy costs.
  - Health and well-being: Offer products with potential savings of €1M annually in healthcare costs related to indoor air quality.
  - Customized solutions: Offer tailored options with potential revenue of €2M annually.
5. **Customer Relationships:**
  - Long-term contracts: Achieve a retention rate of 85%, resulting in €25M in annual sales.
  - Technical support: Offer services generating €2M in repeat business annually.
  - Customer training: Invest €200K annually in educating clients on sustainable building practices.
6. **Channels:**
  - Direct sales: Generate €30M in annual revenues through direct client engagement.
  - Distributors and retailers: Additional €5M in sales yearly through distribution channels.
  - Online platforms: Contribute €500K annually through digital channels for information and support.
7. **Customer Segments:**
  - Construction companies: Offer solutions with potential revenue of €15M annually.
  - Architects and designers: Provide eco-friendly materials, generating €10M.
  - Property developers: Supply sustainable materials for construction projects, with potential revenue of €10M annually.
8. **Cost Structure:**
  - Research and development: Allocate €1.5M annually for innovation.
  - Manufacturing costs: Spend €3M annually on production.
  - Certification expenses: Invest €300K yearly in obtaining eco-labeling and certifications.
  - Marketing and education: Budget of €500K annually for promotion and education.
9. **Revenue Streams:**
  - Direct sales: Generate €30M annually through direct selling.
  - Distribution partnerships: Add €5M to annual revenue through collaborations with distributors.
  - Consultancy services: Contribute €2M annually through advisory services on sustainable building.
  - Subscription-based models: Add €500K to yearly revenue through service subscriptions.





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